

Inside Dope

By GEORGE
F. TAUBENECK



Learn to live and laugh —
thus delay your epitaph

Stories of the Week
Greetings, Expositioners!
Laugh In Every Sentence
Women Have Cold Feet
Best Dealers Specialize

Stories of the Week

Technological progress has moved into deepest Africa. Down through the ages Cannibals slow-boiled captives in simmering stew-pots. Now they cremate them, add hot water, and presto:

INSTANT PEOPLE.

For 20 years an amateur author worked on a volume entitled "S.O.B.'s I've Known."

His brother-in-law chided him for not finishing it.

"Every time I think it's done," the writer sighed, "I meet another one."

If you want a dog, best idea is to get one free from the city pound, because: Bargain dogs never bite.

Debutante's theme song:

"I Should Have Danced All Night."

Greetings, Expositioners!

Good fellowship which surrounds and enhances an All-Industry Exposition is perhaps the greatest recommendation for such a whingding. Competitors learn that their opponents aren't ogres, and fellow-sufferers learn that the compatriots have similar problems.

"Dope" enjoys these con-claves especially—because subscribers introduce themselves, become friendly, and help him do a better job of interpreting their gripes, needs, wants, and aspirations.

In future "Inside Dope" columns and Editorials, much of what you tell us this week will be mirrored.

To those of you who are seeing the NEWS for the first time, let us say that this is your column, if you decide to "join the club."

Being an all-industry newspaper, there will be items here and there which may not be related directly to your individual occupation.

Some of the material herein, for instance, primarily is for wholesalers, some for contractors and dealers, and certain technical articles are useful especially to servicemen—or to manufacturers.

It's quite like your local daily newspaper. Your wife

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PLANS LOOK GREAT FOR '58

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For '58

Airtemp Offers 17 Room Units

CHICAGO — A new broader line of room air conditioners and a new line of gas furnaces for 1958 will be introduced at the 10th Exposition of the Refrigeration and Air Conditioning Industry here by Airtemp Div., Chrysler Corp.

The room air conditioner line contains 17 models including for the first time a 1-hp. casement model. Sizes range from ½ to 2 hp. This is the broadest selection range yet offered by the company.

Equipped with a new down-sweep "contour flame" burner, the residential gas furnaces are offered in four sizes ranging from 81,250 to 150,000 B.t.u.h. input.

The room air conditioner line is divided into three cabinet design series: one for conven-

(Concluded on Page 20, Col. 1)

Kramer Enters Compressor Field

TRENTON, N. J.—The Kramer-Trenton Co. is announcing its entrance into the refrigeration compressor field with the introduction of its "Thermobank" compressor at the 10th Exposition of the Air Conditioning and Refrigeration Industry in Chicago.

(Concluded on Page 47, Col. 1)

Is Accelerated Scientific Progress Ignored By Our Industry?

(A "Conscience of the Industry" Editorial
By George F. Taubeneck)

Staggering are the scientific advances of the last few years. It has been said that more progress has been made in physics and chemistry in the last decade than in the previous three hundred years. And nearly all scientists agree that rapidly-coming developments (which are "on the drawing boards" now) in the next 10 years should dwarf anything we are working with today.

Yet our industry (refrigeration, air conditioning, heating, home equipment) still is plodding along—comparatively speaking—in somewhat the same uncomfortable ruts of design, materials, and production methods which were prevalent in the 1930's.

The only really new development in household refrigerator cabinet design, for example, is the Shelvador. And that was conceived by a woman—Mrs. Frank West, wife of a former chief engineer in our industry.

Typically, Frank couldn't sell the idea to any of the leading manufacturers. Powel Crosley—who then was insignificant as a refrigerator maker—bought it for \$30,000, and promptly became a big factor in the business. When the patents ran out, and every manufacturer put shelves in household refrigerator doors, Crosley appliances died quietly.

See the importance of an imaginative idea?

In recent years, to be sure, household refrigerator producers have added egg racks and butter keepers and other little dingfods. But nothing basically new in household refrigerator cabinets actually has been introduced since the icebox (if we except Mrs. West's contribution).

What's with commercial refrigeration? The ice-maker is an innovation, and open-type frozen foods cases. What else? As for air conditioning? Well, er, the heat pump. . .

(Concluded on Page 42)

'Powerful Sales Ammunition' for '58 On Display at Chicago Exposition

Wichita Survey

Shows 12% Gain In Home Cooling

By C. Dale Mericle

WICHITA, Kan. — Gain of 12% in residential air conditioning installations over the previous year is indicated in the 1957 annual survey of contractors in this city made by AIR CONDITIONING & REFRIGERATION NEWS.

Combined totals of 38 Wichita contractors for the first 10 months of 1957 show 1,307 installations of central cooling and year-round systems in homes, compared with 1,165 by the same number of contractors in the comparable period during 1956.

Earlier surveys in Wichita by the NEWS had turned up a total of 553 residential jobs in 1954 and 979 in 1955.

In the interests of portraying as accurate a picture of the

(Continued on Page 38, Col. 1)

CHICAGO, Nov. 18 — Powerful new ammunition in the way of improved products and components, and engineering and installation aids, will be ready for inspection at the 10th Exposition of the Air Conditioning and Refrigeration Industry, opening today at Chicago's International Amphitheatre.

Some 15,000 members of the industry will be on hand, preparing to "choose their weapons" for the 1958 battle for their share of the public's dollar. After suffering a slight setback in 1957 from the steady and often sharp gains that nearly every segment of the in-

York's '58 Line

Has 'Switchable' Condensing Units

HOLLYWOOD BEACH, Fla. — A new line of York hermetic condensing units with easily separated and changeable components and a "Power Mite" room air conditioner with 30% more capacity in 63% less space highlighted the 1958 line of products introduced by York Corp., subsidiary of Borg-Warner Corp. at its annual distributor convention here recently.

More than 400 distributors from all over the country previewed 1958 York residential and commercial air conditioners, automatic ice makers, and warm air furnaces, as well as the room coolers and condensing units, at the Hollywood Beach hotel.

Principal feature of the new "Flex-O-Metic" compressor-condenser units is that compressor

(Continued on Page 79, Col. 2)

Mitchell Develops 3 New Features In '58 Room Unit Line

CHICAGO — Three new Mitchell engineering developments are introduced in the 1958 line of room air conditioners announced recently by the Mitchell Mfg. Co. here.

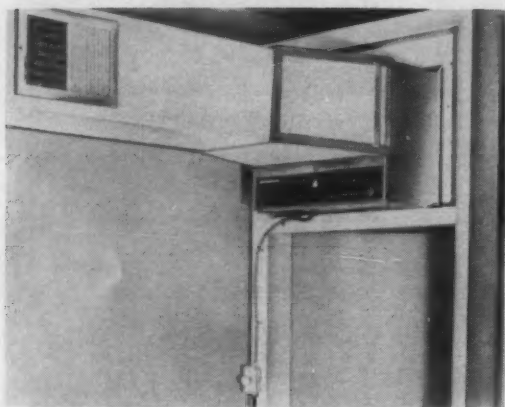
They are a "Floating Air Chamber," a "Variable Aire" system, and a washable micro-static filter made of "Dynel" fibers.

The line consists of a "True Portable" that weighs only 62 lbs., four "Slim 'n-Low" models

(Concluded on Page 4, Col. 1)

**Show Floor Plan,
Exhibitor List
—Page 12**

New 2-Hp. 'Ductaire' Conditioner Offers 'Flexibility'



NEW 2-hp. Westinghouse "Ductaire" self-contained, air-cooled air conditioner will be introduced at the 10th Exposition this week.

CHICAGO — A new 2-hp. Complete with prefabricated "Ductaire" self-contained air-cooled air conditioner that requires only electrical connections, is being introduced by Westinghouse room air conditioner department at the 10th Exposition of the Air Conditioning and Refrigeration Industry. Additional duct sections can be

added to the cooling system as required.

Designed for the small store or office, the Ductaire is also suitable for large stores and offices, by merely locating several to provide good cooling and air distribution.

It is manufactured to deliver 590 c.f.m.

Peerless of America—Booth 344

CHICAGO — Peerless of America, Inc. announced that its exhibit at the 10th Exposition of the Air Conditioning and Refrigeration Industry has been switched from booth 322 to booth 344. This change was made after the list of exhibitors on page 12 was printed.

McQuay Begins Construction on First of Three Plant Additions

MINNEAPOLIS—A contract for the first unit of the three-year McQuay, Inc. plant expansion program at its Faribault plant has been awarded to the P. & W. Construction Co. of Faribault, it was announced here by B. E. James, president.

Construction of this first unit, which will cost approximately \$60,000 will start immediately, James said.

This addition "B" consists of a new dock and steel storage facilities totaling approximately 6,000 sq. ft. It will be equipped with the latest material handling equipment for loading and unloading raw materials as well as handling materials into the production areas, according to the announcement.

James stated that the expansion

is the result of McQuay's rapid growth in the heating, air conditioning, and refrigeration industry, as well as the addition of several new products. The first of these, already in production, is the packaged chimney for the residential market.

He expressed appreciation to the members of the Faribault Industrial Corp., the Chamber of Commerce, and the Faribault City Council for their cooperation and assistance in helping to make this expansion possible.

It is planned that an additional 24,000 to 26,000 sq. ft. of manufacturing and warehouse space will also be added to the present plant during 1958. The third phase of the program planned for 1959 includes an addition of approximately 16,000 sq. ft. of manufacturing space as well as 2,700 sq. ft. of office area.

General offices of McQuay are located in Minneapolis, with manufacturing plants in Faribault, Minn. and Grenada, Miss.

Bryant Ups Hoppock To Head Sales Dept.

INDIANAPOLIS — Appointment of David W. Hoppock as vice president and general sales manager of Bryant Mfg. Co., a division of Carrier Corp., was announced by Ronald N. Campbell, Carrier vice president and president of Bryant.



Hoppock

Until his new assignment, Hoppock has been eastern regional manager in New York City for the Unitary Equipment Div. He started with Carrier in 1945 as staff assistant to Cloud Wampler, now chairman of the board, and subsequently became a district manager for the Unitary Equipment Div.

Hoppock was graduated from Lehigh university and during the war served as lieutenant-colonel in the U. S. Army.

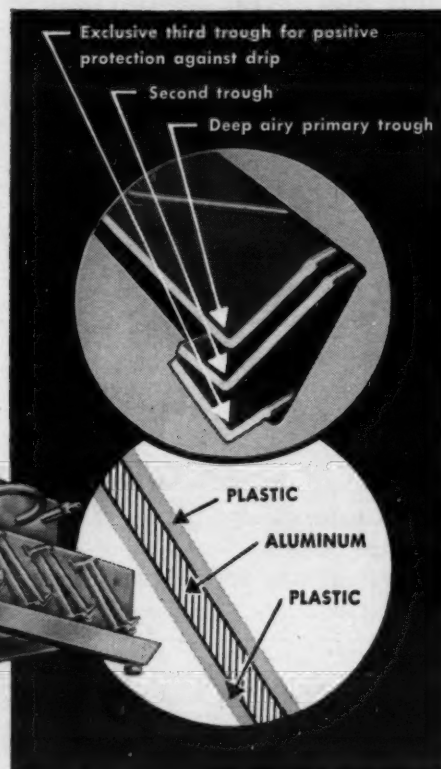
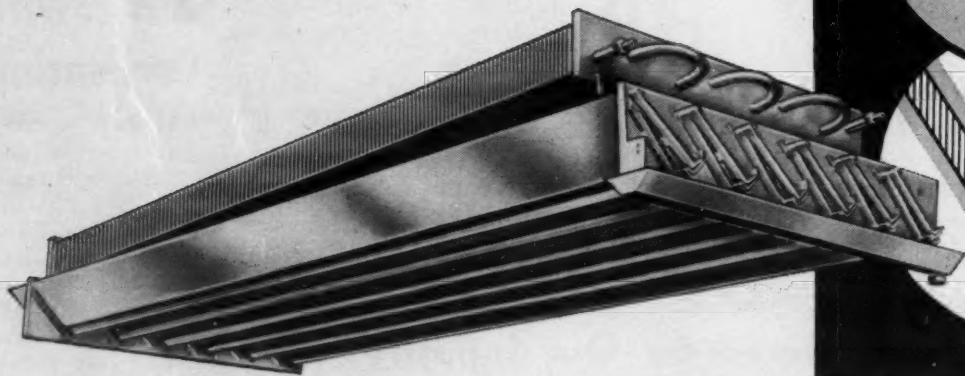
Airlifted Installers Put In Room Units on Borneo Oil Drill Rig

SYRACUSE, N. Y. — Airlifted installation crews—probably the first in the history of air conditioning—have completed the mounting and wiring of 15 room air conditioners aboard an oil drilling rig in the China Sea 26 miles off the coast of British North Borneo, Carrier Corp. reported.

The drilling platform has no protection from the blistering sun and oppressive humidity of this equatorial region, its owners, British Malayan Petroleum Co., discovered. So they decided to air condition all main cabins, mess room, and recreation room.

To accomplish the job in the shortest possible time after the room units arrived, crews from International Air Conditioning Co., Ltd., Carrier distributor, were flown daily by helicopter to the rig.

NEW KRAMER COIL and BAFFLES



with attractive lifetime
PLASTIC CLAD ALUMINUM
at no extra cost!

Permanently Attractive Baffle—Constructed of a new plastic-clad aluminum which combines the strength and flexibility of aluminum with corrosion-resistant plastic for lifetime beauty. It will not chip, peel, corrode, sag, fade nor get brittle. It is absolutely odorless and sanitary. The coil with its colorful baffle will retain its attractive appearance for the life of the cooler.

Dripless Triple-Trough Design—The triple-trough—a unique Kramer feature—provides a deeper primary trough for unrestricted draftless circulation of cool air. The narrow third trough reduces dripping to a minimum, making the Kramer triple-trough baffle virtually drip-proof.

Easy to Install—Kramer coil and baffle combinations are completely assembled at the factory. Shipped in closed wooden cases, they arrive on the job clean and ready for installation, saving assembly and installation time.

Immediate Shipment—A complete range of 15 carefully selected sizes giving maximum Btu per dollar for every application are carried in stock for immediate shipment. Both left-hand and right-hand baffles are available.

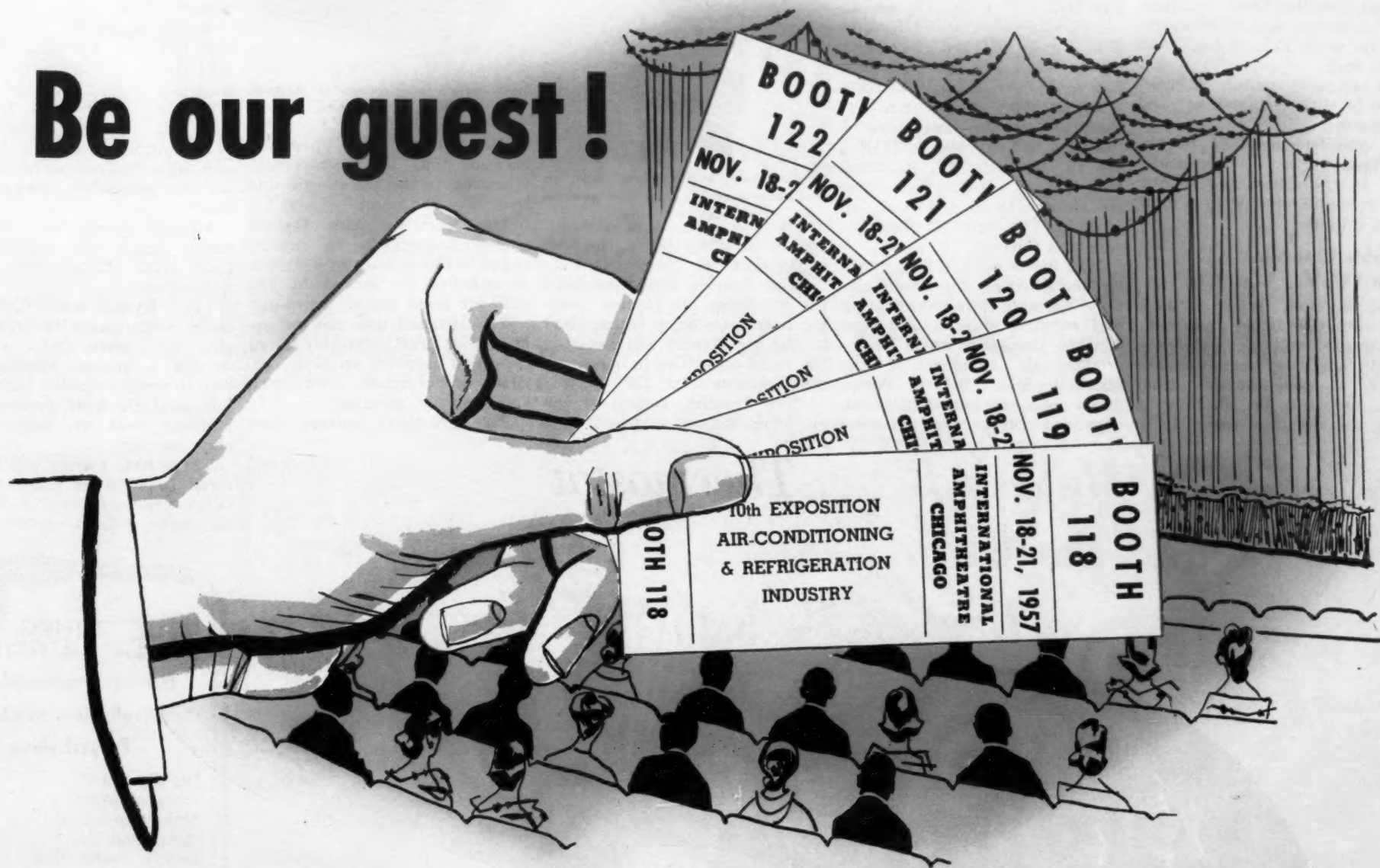
WRITE FOR BULLETIN CBC-276C

KRAMER TRENTON CO. • Trenton 5, N.J.

44 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

For more information about products advertised on this page use Information Center, page 59.

Be our guest!



front-row tickets to a top-flight show...

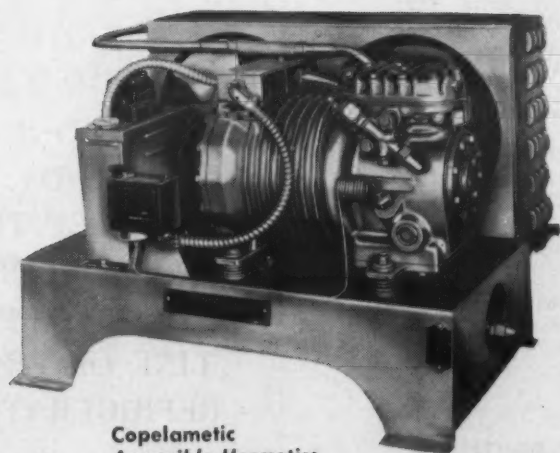
When the curtain goes up on the ALL-INDUSTRY EXPOSITION at Chicago, you can expect a stage-full of the most exciting developments in refrigeration equipment. And we're confident you'll applaud

the big Copeland exhibit... the complete line of top-quality motor-compressors, compressors and condensing units that guarantees perfect performance of your refrigeration and air conditioning.

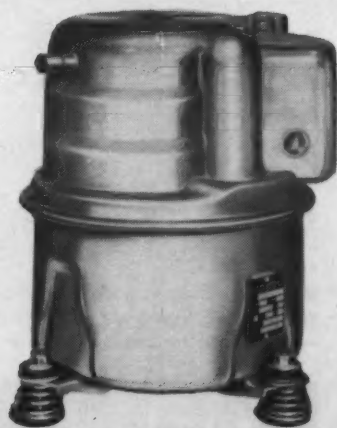
SINCE 1918

Copeland
REFRIGERATION

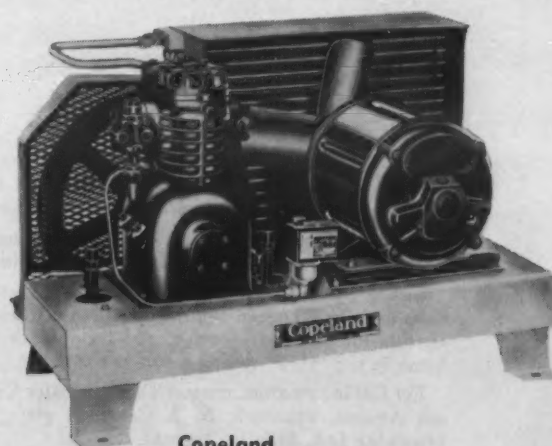
CORPORATION, Sidney, Ohio



Copelametic
Accessible Hermetics



Copelaweld
Welded Hermetics



Copeland
Belt-Driven

For more information about products advertised on this page use Information Center, page 59.

Mitchell's '58 Room Unit Line -

(Concluded from Page 1, Col. 5) and five "Jubilee" models.

The portable, model PO5 H-1, was previewed to the trade last August. Smaller than the average television set, it measures 16 7/8 in. wide, 11 7/8 in. high, and 15 in. deep.

An exclusive snap-in "Minute-Mount" with expanding and contracting filler panels permits complete mobility of the unit through installation in any room in the house and in any size or shape window in a matter of minutes.

Portable Operates On 115-V.

The Mitchell True Portable uses only 6.9 amps, and operates on 115-volt a.c. outlet. A built-in carrying handle makes it easy to move the unit from room to room or to take it along on vacation trips. It is

rated to cool an average bedroom.

The Slim 'n-Low series features four models:

F17 H-1	1 hp., 7 1/2 amps., 115 volts
B10 H-2	1 hp., 230 volts
BA20 H-2	2 hp., 230 volts
B20 H-2	2 hp., 230 volts

Styled with a new non-mechanical look the dimensions of the Slim 'n-Low model F17 H-1 are 15 in. high, 15 3/4 in. deep, and 25 in. wide—the other models are 18 in. by 23 in. by 26 7/8 in. The units fit flush inside and outside.

New in the Slim 'n-Low series is the "Floating Air Chamber," the "Variable Aire" ventilating and exhaust system, and condensate atomizing wheel.

"The air chamber of the Mitchell Slim 'n-Low Series floats on a cushion of half-inch expanded polystyrene that com-

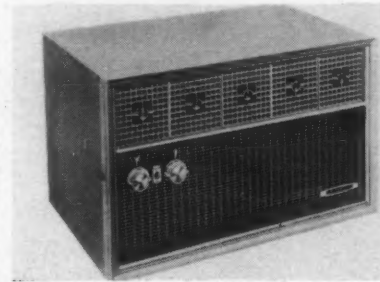


NEW Mitchell "True Portable" room air conditioner uses 6.9 amps and operates on 115-v. a.c. outlet.

pletely isolates it from the rest of the unit," it was stated.

"This floating action insulates the discharge air plenum keeping heat from being transmitted to the air stream and insuring top rated capacities in operating temperatures over 120° F.

"The Floating Action of the air chamber also absorbs op-



FOUR models are featured in Mitchell's "Slim 'n-Low" series.

erating sound and prevents transmission of compressor vibration to the air stream and then into the room."

The Variable Aire feature makes it possible to exactly regulate the amount of ventilate or exhaust air moved by the unit for fresh air or pump-out.

The Mitchell unit can be operated at full, two-thirds, or one-third capacity on both ventilate and exhaust, controlling fresh air or exhaust.

Five directional louvers allow

positive direction of air and maximum control of the draftless cooling pattern.

Featured on model F17 H-1 is a new condensate atomizing system that boosts efficiency by creating an evaporative condenser effect.

Jubilee series is:

A37 H-1	7 1/2 amp., 3/4 hp.
A12 H-1	12 amp., 1 hp.
A12 H-2	230 volts, 1 hp.
A15 H-2	230 volts, 1 1/2 hp.
A20 H-2	230 volts, 2 hp.

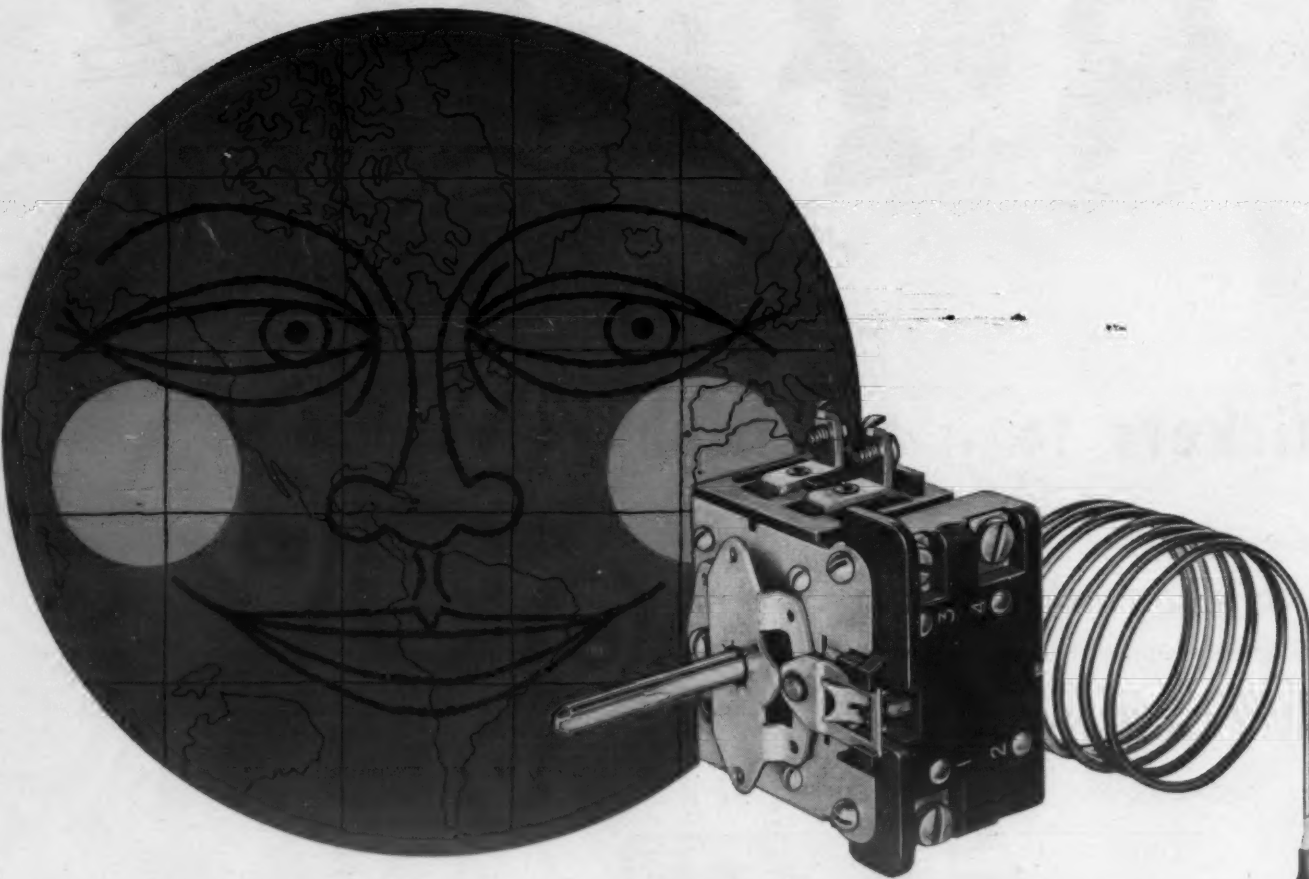
A feature of both the Jubilee and Slim 'n-Low series is the Mitchell washable micro-static filter.

Mitchell claims that "Dynel" fibers make the micro-static filter more efficient than ordinary filters.

(1) "Dynel" micro-fibers remove large particles from the air; (2) micro-static charge creates a second filtering action to remove smaller particles; (3) final air wash removes remaining dust or pollen that slips through.

Three heat pumps will be offered in 1958 as standard reverse cycle or reverse cycle with automatic defrost controls.

Make a Better Thermostat and the World Beats a Path to Your Door



THE WILCOLATOR SERIES G & GA IS NEW—YET 15 of 25 LEADING AIR-CONDITIONERS ARE USING IT

Here is a versatile new thermostat for cooling applications; higher rated for new heavy duty appliances and medium industrial requirements.

The GA version features a special switch, cam-operated from the dial shaft, capable of controlling several circuits with a single dial. In an air-conditioner this switch enables the G2A to provide for "OFF" position, "FAN ONLY" and "FAN AND COOLING" from a single dial shaft.

Amplitude can be factory adjusted to customer's specifications. Contact mechanism is not affected by vibration.

The Wilcolator G & GA is also made for heating applications and the G1A can control both "BAKE" and "BROIL" circuits for an electric range, and incorporate double pole break in the "OFF" position.

For full information, contact The Wilcolator Co. 1001 Newark Avenue, Elizabeth, N. J. Canadian plant: Wilcolator (Canada) Ltd., Mimico, Toronto, Canada.

SPECIFICATIONS:

Standard temperature range: 40° F Min., 550° F Max.

Special temperature ranges: to customer's requirements.

Type G1 and G1A: Contacts open on temperature rise.

Type G2 and G2A: Contacts close on temperature rise.

Contact rating: Type G1 and G1A, 30 Amp. 125 and 250 volts—AC non-inductive load.

Motor Ratings: Type G2 and G2A

VOLTS	RUNNING CURRENT	LOCKED ROTOR
120 AC	14 AMP	60 AMP
208 AC	14 AMP	60 AMP
240 AC	14 AMP	60 AMP

Both motor and non-inductive ratings Underwriters listed and approved.

Mounting: Back of panel or in enclosure.

Terminals: Screw Type, AMP or Arkles. Standard shaft size — 1/4" flatted to .156". Length to customer's specifications.



VISIT BOOTH 658
ARI CONVENTION,
CHICAGO, ILL.

PIPE, TUBING & FITTINGS

Thermo-Engineered in

Kralastic • SARAN

Polyethylene

Top Elasticity	BIG STOCK
Vibration-proof	
High Temp Range	LOW COST
Non-Electrolytic	
Smooth Inside Bore	
Chemically Inert	ALL SIZES
Ease of Assembly	

CLAMPS for TUBING, WIRING

Fast to install. Secure. No shorts! No tearing! No corrosion! Tough, permanent, SAFE! All Styles, shapes and materials.



Write today for prices, samples

943 GEORGE ST. CHICAGO 14

COMMERCIAL PLASTICS

FRICK - THE
LEADER IN THE
REFRIGERATION
INDUSTRY SINCE
1882—HAS MADE
ANOTHER STEP
FORWARD.

VISIT BOOTH #314
AT THE A.R.I.
EXPOSITION IN
CHICAGO NOV. 18-21
AND SEE THE
NEWEST ADDITION
TO THE COMPLETE
LINE OF FRICK
REFRIGERATION.



and NOW... from **RECOLD**
who developed the revolutionary
WATER DEFROST and VAPOMATIC COILS
... comes another FIRST in defrosting!
"IT" will be unveiled during the ARI Show
in Chicago, November 18-21



Be sure to see "IT"
at the RECOLD BOOTHS
(Numbers 116 and 117).

You are invited

Recold was recently selected from thousands of firms to be featured on the television program, "Success Story," which is produced weekly under the sponsorship of the Richfield Oil Corporation. During the ARI Show, the film will be shown at the Recold booth and you are cordially invited to view this film, which will graphically show you why RECOLD is *always* FIRST!

RECOLD

CORPORATION

7250 East Slauson Avenue, Los Angeles 22, California

For more information about products advertised on this page use Information Center, page 59.

ARI Publishes New Standard for Residential, Commercial and Industrial Air Conditioning

WASHINGTON, D. C. — A new standard for unitary air conditioning equipment was published recently by the Air-Conditioning & Refrigeration Institute.

Supersedes 2 Standards

In announcing the standard, which supersedes ARI Standard 2-10 (Self-Contained Air Conditioners) and ARI Standard 620-56 (Published Ratings for Residential Air Conditioners), the Institute "gratefully acknowledges the assistance, co-operation, and endorsement of the National Warm Air Heating and Air Conditioning Association" in the preparation of this new standard.

Numbered 210-57, the new

standard applies to factory-made residential, commercial, and industrial air conditioners or matched assemblies as defined in the standard, and includes performance and safety standards and methods of rating and testing. It does not include standards for heating equipment, for the heating function of unitary air conditioning equipment, for heat pumps, or for room air conditioners.

(Room air conditioners are covered already in ARI Standard 110-56, and a new separate standard for unitary heat pump equipment will be published by the Institute shortly.)

Standard 210-57 provides that "Standard ratings relating to

as total cooling capacity and expressed only in terms of B.t.u. per hour; or equivalent tons, expressed in multiples of one-tenth of a ton (one ton being the equivalent of 12,000 B.t.u. per hour)."

Definition

As defined in the standard: "A unitary air conditioner consists of one or more factory-made assemblies which normally include an evaporator or cooling coil, a compressor and condenser combination or, alternatively, a fuel-operated cooling apparatus, and may include a heating function as well.

"Where such equipment is provided in more than one assembly, the separated assem-

blies are to be designed to be used together, and the requirements of rating outlined in this standard are based upon the use of matched assemblies. This standard does not apply to the rating and testing of individual assemblies, such as condensing units or coils, for separate use.

"Unitary air conditioners, either alone or in combination with a heating plant, are to provide the functions of air-circulating, air-cleaning, cooling with controlled temperature, and dehumidifying, and may optionally include the function of heating and possibly humidifying."

Standard 210-75 was prepared under supervision of the Engineering Committee of ARI's Self-Contained and Residential Air-Conditioner Section, of which P. W. Wyckoff of Air-temp Div., Chrysler Corp., is chairman. It is available from ARI at 35 cents per copy.

Nationally Prominent Authorities Take Part In McCray Meeting

FORT WAYNE, Ind. — Nationally-prominent authorities in the fields of refrigeration, food-marketing, finance, market research, and economy participated in the national sales meeting here of McCray Refrigerator Co., Nov. 14-16.

About 200 McCray distributors from all parts of the country attended the meeting, according to J. W. Krall, McCray president.

Among those participating in the various sessions and discussions were:

Dr. Robert J. Clark, economist on the staff of Lionel D. Edie & Co., New York City; Arthur Woods, vice president, Commercial Credit Corp., Baltimore; Mrs. Marie Kiefer, secretary-manager, National Association of Retail Grocers of the United States, Chicago; Ralph E. Ernst, consulting engineer for NARGUS.

Also, Stuart W. Brown, Chicago, sales manager, frozen foods department, Swift & Co.; Tom Collins, publicity director, National Bank and Trust Co., Kansas City, Mo., who was the featured banquet speaker Saturday night, Nov. 16; Roy King, merchandising manager, *Food Topics* and *Food Field Reporter*; and Robert F. Burbach, Chicago staff of the *Progressive Grocer*.

Arrangements for the meeting were in charge of H. E. Cooper, McCray sales manager, and W. L. Herald, advertising manager.

Frigidaire Closes Display In Furniture Mart, Will Show at Sherman Hotel

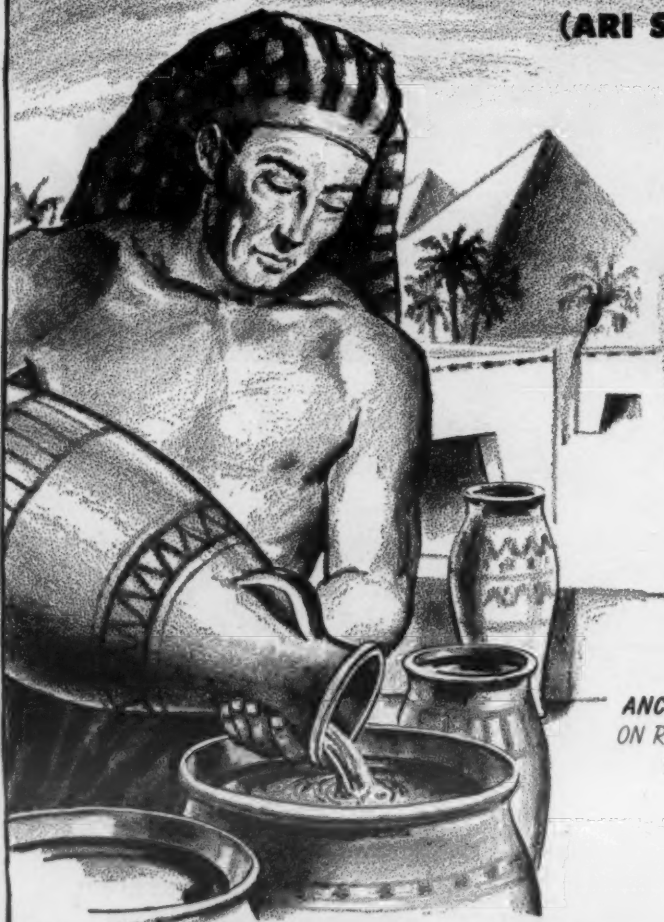
DAYTON—Frigidaire Div. of General Motors Corp. has closed its Chicago exhibit in the American Furniture Mart and will have a much larger display during the Winter Furniture Market in the Bernard Shaw Room of the Sherman hotel, according to C. H. Menge, general sales manager.

"The new arrangement is a departure which we feel will prove convenient for our guests and which will provide us more than twice as much floor space, making possible a complete display of our 1958 'Sheer Look Plus' appliances, as well as three Frigidaire 'Idea Kitchens,'" Menge further explained.

HIGHLIGHTS

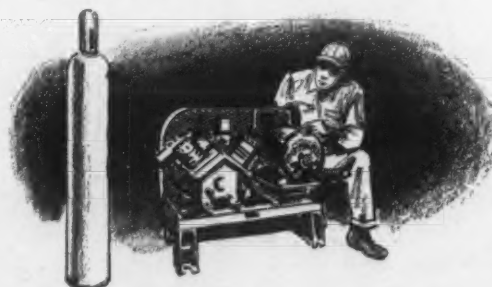
FROM "THE STORY OF FREON"

(ARI Show, Chicago)



CAVEMEN GROPE DOWN TO THE DARK COOL RECESSES OF THEIR CAVES TO ESCAPE THE HOT SUMMER HEAT.

ANCIENT EGYPTIANS PLACED POROUS EARTHEN JARS OF WATER ON ROOF TOPS OVERNIGHT. RAPID EVAPORATION FORMED THIN ICE, WHICH WAS COLLECTED TO COOL THE PHARAOH'S DRINKS.



TODAY REFRIGERATION AND AIR CONDITIONING CONTRIBUTE VITALLY TO ALMOST EVERY AREA OF OUR SOCIETY. WITHOUT FREON* REFRIGERANTS, MUCH OF THE PROGRESS MADE IN THESE FIELDS WOULD NOT HAVE BEEN POSSIBLE.

DU PONT

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

DON'T MISS THE COMPLETE STORY OF "FREON" AT THE ARI SHOW



• You'll see unusual displays, live demonstrations, a fascinating exhibition of the properties of "Freon", and many other interesting and instructive features. Be sure to see our exhibit in booth 402 at the 10th Exposition Air Conditioning and Refrigeration Industry in Chicago, November 18 to 21.

*Freon and combinations of Freon- and F- with numerals are Du Pont's registered trademarks for its fluorinated hydrocarbon refrigerants.

THINK OF ACE WHEN YOU THINK OF REFRIGERATION CABINETS



- Frozen food and ice cream display cabinets with automatic defrosting
- Milk and dairy display cases
- Ice cream storage cabinets
- Self-service frozen food display cabinets
- Wall type display cases
- Heavy-duty commercial upright freezers

ACE CABINET CORPORATION
358 Belleville Avenue, New Bedford, Mass.

THE SWITCH IS ON



In Jefferson City, Missouri, Harold Butzer says . . .
"Westinghouse has the name and the products. But most important, they have a plan to sell central residential air conditioning *locally* . . . the way it has to be sold! It's the biggest forward step toward *selling* we've seen in a long time."

BETTER CHECK! Some areas still have openings for aggressive contractors. Call any of these seven men of action for details.

Jim Reynolds
Pittsburgh, Pennsylvania
EXpress 1-2800

Milt Bevington
Atlanta, Georgia
TRinity 4-1641

Bob Haubold
Dallas, Texas
Riverside 1-5109

Bill Constance
Los Angeles, California
RAYmond 3-9071

Walt Hunken
Staunton, Virginia
STAunton 6-0711

Tom Mullen
Chicago, Illinois
WHitehall 4-3860

Al McDonald
St. Louis, Missouri
GARfield 1-6911

Nationwide, installing contractors are discovering pay dirt in the Westinghouse powerhouse sales plan.

Now, Westinghouse has a new plan for stepping up central air conditioning sales and profits. It's a power-packed sales-building program tailored to local markets.

Here's what's happening . . .



In Miami, Florida, Marshall Berkson sells Westinghouse because . . . "I can see *Westinghouse means business* . . . business for local contractors. This '58 program has sales power that can be turned into sales profit. I've got my men so excited they'll take this market by storm."

J-80552

IN AIR CONDITIONING, THE SWITCH IS TO
Westinghouse®

Westinghouse Electric Corporation • Air Conditioning Division • Staunton, Virginia

For more information about products advertised on this page use Information Center, page 59.

Inside Dope

By GEORGE
F. TAUBENECK

(Concluded from Page 1, Col. 1)

probably skips the sports section, you don't read the society pages or advice to the lovelorn, and the financial page has nothing for your daughter. But everybody reads the comics and the syndicated "human interest" columns.

Purpose of "Inside Dope" is to have something for everybody—humor, human interest, unusual information about the industry, predictions for the future, practical analyses of economics affecting your job—PLUS "audience participation."

That's where YOU come in. Substantial numbers of subscribers contribute jokes, ideas, and even gripes to "Inside Dope," and enjoy seeing their

efforts in print. Would you like to join "the club"?

Laugh In Every Sentence

For example, right now we are interested in *double entendre* typographical errors. Here are some dandies which subscribers have found in their local newspapers, and sent to "Dope":

Mike bought Liz a Silver Cloud Rolls Royce, and while she was still in a brace it wasn't comfortable, so he had a phone put in it.—*Detroit Free Press*.

A shot rang out in the night and Boswell fell with a bullet hole in his thing. Just a flesh wound, though.—*San Jose Mercury-News*.

The doctor who examined Mrs. Ravelli's body after death is absolutely certain that death resulted.—*New York Post*.

Johnson lacks the speed the Wolverine coach would like at the pot.—*Detroit Free Press*.

Now milk suppliers are being frozen in quart blocks and shipped north in wax cartoons.—*Philadelphia Enquirer*.

Evanses Don't Sound Good Like Grammarians Should.—*Chicago Tribune*.

Lord Colum Edmund Crichton-Stuart was a son of the third Marquess of Bute, an island in the Firth of Clyde.—*New York Times*.

Mayor Sits on Throne All Morning.—*Malden (Mass.) Evening News*.

Women Have Cold Feet

Madame Pompadour, reputed to be one of the most torrid ladies in French history, had cold feet. So did other pulchri-

tudinous gals whom King Louis the Fifteenth ogled.

How does one deduce this fact? A modern Sherlock Holmes would note: (1) Madame Pompadour wore long, full skirts which swept the floor. (2) French castles and palaces were heated by fireplaces. (3) Warmth generated by these primitive heaters traveled upward through the chimneys, and left floors frigid.

Madame Pompadour didn't wear her skirts long because she was modest. Her low décolleté dresses, as a matter of fact, exposed an interesting bosom. However, air on the floors of those French castles was so shivery that Madame and her sorority sisters wore long skirts in self-defense.

Had King Louis engineered his palaces for warm floors, Madame Pompadour would have been just the type to dis-

play her shapely limbs while wearing shorts.

Far too often, even today, heating systems are installed without proper planning or study of the heat loss and heating requirements of a home. A properly designed system should insure winter comfort at minimum cost. Also it will decimate colds and allied human discomforts.

Mr. Contractor: be sure that in the case of a perimeter system, it be installed according to design manuals of the National Warm Air Heating & Air Conditioning Association. Those fellows have the customer's best interests at heart, as well as yours.

Best Dealers Specialize

"After a couple of years," Bill Switzer (Frigidaire merchandising manager) was holding forth, "you can usually tell what kind of job a dealer is going to do.

"If he sells 50 refrigerators, 20 freezers, 10 washers, and five ranges his first time at bat, that's the pace he is apt to maintain—allowing for fluctuating business conditions, of course."

"There's another side to that story," chimed in General Manager Herman Lehman. "If he sells a lot of laundry equipment the first year, he may not pay sufficient attention to refrigeration.

"If he's a television hotshot he probably will neglect freezers and air conditioners.

"Some dealers are great with ranges. You don't necessarily expect those fellows to move air conditioners, either, or laundry equipment."

An interested listener asked if that meant the "retail diversification" pendulum may have swung too far.

"It could be," nodded Mr. Lehman. "The dealer who has many makes of too-diversified products on his floor is likely to be a price-man. He can't SELL because he can't concentrate. He can't generate enthusiasm because his loyalties are dissipated. He can't build up long-term patronage—repeat sales to satisfied customers—because he can't, or doesn't, give enough attention to service. So price discounts are his last resort.

"It's difficult for a dealer who represents a miscellany of stuff on a cut price basis to maintain an adequate service organization. Nor is the catch-all retailer usually interested."

Mr. Lehman was reminded that philosophy of this sort was almost revolutionary—in this day of wheeling-and-dealing, of piling table appliances upon big ticket products, of manufacturer franchising of anyone with a letterhead, of "service is for the birds" attitudes.

"Listen!" this normally mild gentleman exploded. "Service is the keystone of this business—service and salesmanship. Yes, and loyalty, too.

"In 30 years I've seen a lot of dealers come and go. Those who make the most money, and last the longest, concentrate on a single line.

"They build a reputation for service. And they SELL successfully because they concentrate. The man who fires at random brings down few birds."

SO HALSTEAD & MITCHELL ENGINEERS SAID...

FOR AUTOMATIC, ALL-WEATHER OPERATION USE H&M AIR-COOLED CONDENSERS WITH LIMITROL



SEND FOR NEW BULLETIN AC-101

All-weather operation of air conditioning and refrigeration units is automatic—no manual changeover is required—when the exclusive Limitrol modulating valve is used with Halstead & Mitchell's air-cooled condensers. The Limitrol effectively maintains balance between condenser and compressor under all outdoor ambient conditions by regulating condenser capacity. And winter problems with water-cooled systems are avoided.

H&M's air-cooled condensers with exclusive Turbu-Flo fin design allow peak Btuh at the evaporator. The embossed, streamline pattern provides better air wash, reducing air film resistance, and improving heat transfer by up to 15%. Wide fin spacing assures rated capacity longer. Service costs are less, too.

Installations involving many condensing units are made much easier and less costly. Halstead & Mitchell will provide multiple circuiting to meet specified requirements (if requested) at no extra charge—on all 12 models.

Call your wholesaler for more information or write Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.



'Turbu-Flo air-cooled condensers for remote installations'



Two AC-20's and one AC-25 handling condensing requirements for all ordinary office equipment for a department

HM
Halstead & Mitchell

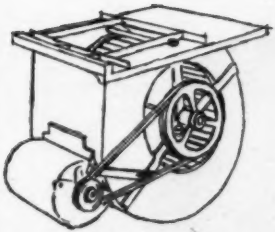
IN YOUR BUSINESS...



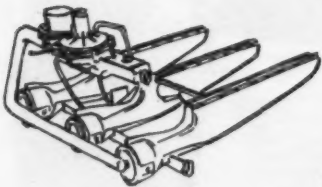
You don't have to be
an Economist to know
the difference between
"PRICE"
and
"VALUE"

HOW MUCH THE BUYER PAYS IS PRICE!

HOW MUCH HE GETS FOR WHAT HE PAYS IS VALUE!

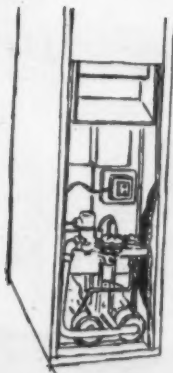


Large 13 1/8" diameter blowers, rubber mounted, give tremendous air handling capacity at lowest tip speed—the secret of quiet operation with least wear. All FRASER-JOHNSTON belt-driven furnaces carry 0.6 in. AGA high static approval.

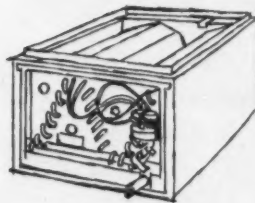


Multi-purpose burners with built-in aspiration give long-life, non clogging operation for all gases, including LPG.

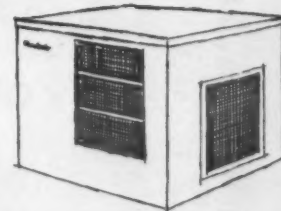
Adjustable fan and limit controls make it easier to attain high quality comfort at every temperature.



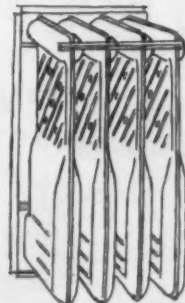
Foil and fiberglass lined casing for cool, quiet efficiency. Controls assembled and wired at factory. All service from front. Slide-out blowers.



Matching cooling coils for all models in 2-3-4-5-6-ton capacity offer minimum static — 0.11" W.C. dry and 0.14" W.C. wet at 400 CFM per ton.



Condensing units, either air cooled or water cooled, available with propeller type fan or centrifugal type fan, will operate under extreme temperature conditions.



Updraft heat exchanger, streamlined with no internal baffles, no hot spots, no pockets for condensation. Die-formed, completely welded construction.

These are not only consumer benefits, they're *dealer benefits*. They mean easier selling with greater user satisfaction and less service than any so-called "cheap" line.

If you want to know more about the *value-line*, write for catalog information and prices TODAY.

Fraser-Johnston

OVER A QUARTER CENTURY OF LEADERSHIP

1900-17TH STREET • SAN FRANCISCO, CALIFORNIA

Winter Operation of Cooling Towers, Evaporative Condensers

Can Bar, Control, or Remove Ice by Varying Use Method

Expert Suggests 3 Schemes:

Normal Circulation; Spray On, Fan Off; Spray, Fan Off, By-Pass Water

NEW YORK CITY — Winter operation of air conditioning cooling towers and evaporative condensers poses serious problems of freezing and ice formation, warns Dr. Sidney Sussman, chief chemist of Water Service Laboratories, Inc., who suggests a number of techniques for avoiding these troubles.

He points out that winter operation of this type of equipment is increasing rapidly because of its wider use in air conditioning systems, the intermittent operation of such systems even during cold weather, and the year-round use of air conditioning for special locations such as electronic computer rooms.

Cold weather operation of such outdoor equipment containing water raises the possibility of troubles resulting from freezing and ice formation in many parts of the country.

In general, ice formation during winter operation may be prevented, controlled, or removed by varying the method of operation of the cooling tower or the evaporative condenser, he says. In many cases this must be done merely to prevent the circulating water from getting too cold. Dr. Sussman suggests three operational schemes for winter operation:

A. Normal circulation with both sprays and fan in operation.

B. Sprays on but fan off.

C. Neither sprays nor fan operating. Water flow is bypassed through the pan of the cooling tower.

Some Use All 3 Plans At Different Times

Some installations make use of all three of the above procedures at different times. Or, the procedures are modified by using the cooling water temperature to control a thermostatic valve which varies the amounts of the circulating water going to the sprays and to the pan.

The prevention of freezing in exposed circulating water lines when the cooling tower or evaporative condenser is not being operated can best be accomplished by mechanical methods, according to Dr. Sussman.

One technique described by the chemist is to use a dump or surge tank indoors. The equipment is arranged so that every time it is shut down or every

time the water temperature falls below a specified minimum, say 35° F., the contents of the outside portions of the system drain into the surge tank.

In most such installations, during winter operation the cooling tower pan or evapora-

tive condenser does not contain the same depth of water as during summer operation. Instead, the pan drains completely as soon as the circulating water flow is shut off.

A second technique for protection of exposed water lines

from freezing is to wind about them thin copper steam tubing or electrical resistance wire, and to cover this with insulation. The lines can then be heated by steam or electricity, controlling the application of the heat with a thermostatically controlled switch or valve located at the coolest spot in the system.

Such installations are generally set to start the heat when the water reaches about 35° F. and to shut it off when the water gets to about 40° F. It is usually not necessary to pro-

tect the cooling tower pan since the formation of ice in it will cause no damage, although in some cases the pan is also heated by the same method in order to insure against freezing completely and thereby interfering with water flow when the equipment is to be operated.

A commonly suggested protection from freezing when the water is not circulating during the winter months is the addition of glycol anti-freeze, but there are several reasons why

(Concluded on next page)

Jenni Genetron says:

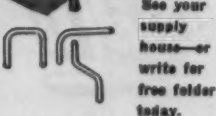
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See your supply house—or write for free folder today.



HOLSCLAW BROS., INC.

438 N. Willow Road • Evansville, Indiana

Winter Cooling Tower Operation --

(Concluded from preceding page)

this method is not entirely practicable, according to the Water Service Laboratories executive.

Special Measures Needed with Glycol

In the first place, under certain conditions the glycol may react with chemicals that have been added to the cooling water for protection of the equipment against corrosion or scale for-

mation, he notes. More important, however, is the fact that special measures are needed to keep enough glycol in these cooling systems to be effective and these measures may make its use too costly, he points out.

The excessively high cost of using glycol as an anti-freeze in a cooling tower when both fans and sprays may be operated can be realized, he says, by considering an average cooling tower

which circulates 3 g.p.m. per ton of refrigeration and has a windage loss of approximately 0.15% of the circulating rate. Thus, for a 100-ton cooling tower the windage would be 0.45 g.p.m.

"If glycol were required to protect such a tower to -10° F., a common level for anti-freeze protection in many areas, it would be necessary for the circulating water to contain 38% glycol by volume," it is stated. "Thus, the 0.45 g.p.m. windage loss would actually include 0.17 g.p.m. of glycol. Of

course, the bleed would also include the same proportion of glycol, but we will ignore the bleed for the purposes of the present calculation.

"With glycol costing about \$1.80 per gallon in large quantities, the windage would represent a loss of 31¢ per minute for a 100-ton cooling tower, or a little more than \$18 per hour of operation. In other words, the loss of glycol under these conditions would be 18¢ per hour per ton."

With Large Rate Loss, Protection Against Freezing Is Poor

With such a large rate of loss of glycol and with the makeup water continuously diluting the circulating water, Dr. Sussman points out that the equipment would soon be inadequately protected against freezing and it would become necessary to provide equipment for the continuous feeding of makeup glycol.

"Obviously, during much of the winter the reduced use of sprays and fan would greatly reduce the windage loss and the resultant glycol loss," the report states. "However, there would still be water losses, such as those at pump bearings, which would necessitate the feeding of glycol in order to prevent freezing.

"In addition, during the periods of alternating moderate and severe weather in the early and late winter there are many times when both sprays and fan would be used and heavy glycol losses would occur.

"That such glycol losses are not merely theoretical is shown by the recent experience of a large industrial company at one of their Long Island plants. They attempted to protect two 35-ton cooling towers by the addition of glycol. Despite the addition of \$150 worth of this anti-freeze they were never able to find any appreciable glycol content in the circulating water when using a hydrometer and the equipment was full of ice much of the winter."

'Minimize by Simple Procedures'

When air conditioning requires the use of cooling towers or evaporative condensers during winter weather, ice formation and freezing damage can be minimized by simple changes in the method of operation, Dr. Sussman says in summary. When it appears that winter use will be necessary, the operation of the cooling system should be analyzed well before freezing weather sets in, in order to allow time for making any necessary mechanical changes.

Water Service Laboratories, Inc. is a firm of research and consulting engineers specializing in the field of water treatment and other water problems.

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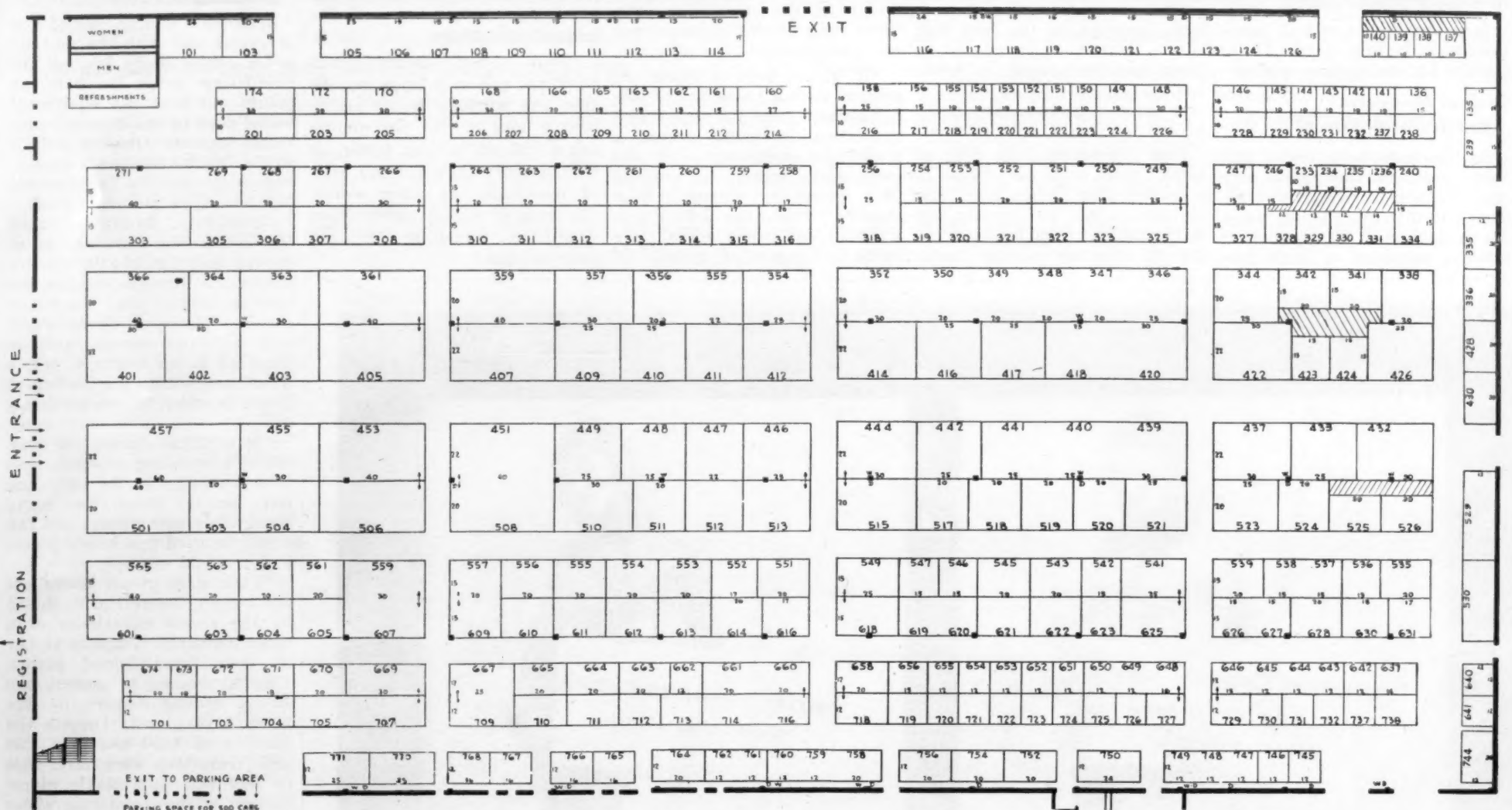
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Addison Products Co.	611-12
Aeroquip Corp.	641
Aerovox Corp.	745
Air Conditioning & Refrigeration News	517
Air-Conditioning & Refrigeration Wholesalers	2
Air Con Filter Mfg. Co.	628
Airserco Mfg. Co.	146
Airtemp Div., Chrysler Corp.	105-6-7-8-9-10
Alco Valve Co.	444
Allen-Bradley Co.	767-68
Allin Mfg. Co.	662
American Automatic Ice Machine Co.	503
American Brass Co.	521
American Coils Co.	663-64-65
American Gas Machine Co.	747-48-49
American Name Plate & Mfg. Co.	223
American Platinum Works	744
American Society of Refrigerating Engineers	1
Aminco Refrigeration Products Co.	207
Anderson Chemical Corp.	605
Ansul Chemical Co.	449
Appliance Manufacturer	211
Armstrong Cork Co.	163
Arrow-Hart & Hegeman Electric Co.	232
Bacharach Industrial Instrument Co.	222
Bally Case & Cooler Co.	667-709
Baltimore Aircoil Co.	648-49-50
Bangor Mill & Cooler Co.	602
Barr Mfg. Co.	542
Bastian-Blessing Co.	765-66
Bell & Gossett Co.	525-26
Bendix-Westinghouse Automotive Air Brake Co.	414
Binks Mfg. Co.	230-31
Bohn Aluminum & Brass Corp.	359
Brookside Corp.	428
Brunner Mfg. Co.	349-50-52
Bryant Div. of Carrier Corp.	409
Buchbinder Bros.	316
Bundy Tubing Co.	545
Burr Oak Tool & Gauge Co.	523
Butcher Boy Refrigerator Door Co.	432
Byers Co., A. M.	711
Calgon Co., Div. of Hagan Chemicals & Controls, Inc.	226
Carbonic Dispenser, Inc.	212
Carrier Corp.	510

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Century Electric Co.	625	General Electric Co., Bloomfield, N. J.	515	Mechanical Industries Production Co.	618	Silver Refrigeration Mfg. Co.	138
Chase Brass & Copper Co.	562	General Electric Co., Schenectady, N. Y.	111-12-13-14	Meier Electric & Machine Co.	546	Small Business Administration	6
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Cobra Metal Hose	720	Halstead & Mitchell	335	Metrex Valve Co.	142-43	Southern Plastics Co.	139
Coldin Cabinet Co., Inc.	135 & 239	Harry Alter Co.	713	Midwest Mfg. Co.	219	Southwest Mfg. Co.	671
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Commercial Refrigeration & Air Conditioning	670	Henry Valve Co.	669	Minneapolis-Honeywell Regulator Co.	561	Sprague Electric Co.	166
Copeland Refrigeration Corp.	118-19-20-21-22	H & H Tube Mfg. Co.	258	Mitchell Mfg. Co.	422	Standard Refrigeration Co.	563
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Cyrus Shank Co.	216	Howard Refrigerator Co.	153	Mundel Cork Corp.	721	Superior Valve & Fittings Co.	556
Davison Chemical Co., Div. of W. R. Grace & Co.	364	Howe Ice Machine Co.	710	National Commercial Refrigerator Sales Association	5	Tecumseh Products Co.	457
Dean Products, Inc.	308	Huck Mfg. Co.	412	National-U. S. Radiator Corp.	269 & 271	Temple Products Corp.	504
Delco Products Div., GMC	448	Hussmann Refrigeration, Inc.	155	Nickerson & Collins Co.	552	Tenney Engineering, Inc.	619-20
DeMert & Dougherty, Inc.	673	Ideal Cooler Corp.	170	Olin Mathieson Chemical Corp.	537-38	The Texas Co.	203
Detroit Controls Corp.	557-609	Imperial Brass Mfg. Co.	205	Onan & Sons, Inc., D. W.	712	Emery Thompson Machine & Supply Co.	722
Dole Refrigeration Co.	366	Industrial Wire Cloth Products Corp.	622	Owens-Corning Fiberglas Corp.	610	Tork Time Controls, Inc.	651
Dow Chemical Co.	756	Jacks-Evans Mfg. Co.	259	Pacific Lumber Co.	218	Torrington Mfg. Co.	361
Dunham-Bush, Inc.	346-47-48	Jamison Cold Storage Door Co.	101	Paragon Electric Co.	313	T O T Hovers, Inc.	161
du Pont de Nemours & Co., Inc., E. I.	402	Jarrow Products, Inc.	238	Parham Industries, Inc.	730	True Mfg. Co.	172
Duro-Dyne Corp.	330	Jordan Commercial Refrigerator Co.	529	Peerless of America, Inc.	322	Tube Manifold Co.	727
Dwyer Mfg. Co., F. W.	331	Keco Industries, Inc.	354	Peerless Equipment Corp.	150-51	Tyler Refrigeration Corp.	256 & 318
Ebco Mfg. Co.	771	Keeney Co.	704	Penn Controls, Inc.	541	Typhoon Air Conditioning Co., Div. of Hupp Corp.	303
Electric Auto-Lite Co.	674	Kelvinator Div., American Motors Corp.	453	Pennsalt Chemicals Corp.	565	United Cork Co.s	338
Electro Dynamics Div. of General Dynamics Corp.	233-34	Kenmore Machine Products, Inc.	307	Perfection Industries, Div. of Hupp Corp.	455	United Friguarator Engineers	229
Elkhart Products Corp.	731	Kerolast Mfg. Co.	519	Price & Rutzebeck	737	United Refrigerator Co.	208-9
Emerson-Quiet Kool	442	Kirsch Co.	327	Ranco Inc.	410	United Wire & Supply Corp.	764
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Essex Wire Corp. R-B-M Div.	221	Kold-Hold Div., Tranter Mfg., Inc.	407	Refrigeration & Air-Conditioning Contractors Association	3	Utility Fan Corp.	268
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Encyclopaedia Britannica	723	Larkin Coils, Inc.	405	Refrigerating Specialties Co.	411	Viking Copper Tube Co.	312
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Fafnir Bearing Co.	261	Lehigh Mfg. Co., Div. of Lehigh, Inc.	156-58	Refrigeration Research, Inc.	214	Virginia Smelting Co.	549
Fasco Industries, Inc.	554	Lewin-Mathes Co.	770	Remco, Inc.	336	Vogt Machine Co., Henry	754
Federal Refrigerator Mfg. Co.	148-49	Linde Co., Div. of Union Carbide Corp.	319	Revcor, Inc.	719	Wabash Corp.	154
Fiber Bond Corp.	603	Liquid-Freeze Corp.	761-62	Reynolds Metals Co.	451 & 508	Wagner Electric Corp.	672
Flexible Tubing Corp.	511	Lloyd Scruggs Co.	536	Rheem Mfg. Co.	174	Wall Tube & Metal Products Co.	642
Fogel Refrigerator Co.	530	Lonergan Mfg. Co.	403	Ritter Metal Corp.	629	Walton Laboratories, Inc.	752
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Frankell Mfg. Co., Inc.	165	McCray Refrigerator Co., Inc.	305-6	Rotary Seal Div. Muskegon Piston Ring Co.	254	Watco, Inc.	235-36
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Garman Co., Inc.	724	Marley Co., The	267			Wilcolator Co.	658
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General Chemical Div., Allied Chemical & Dye Corp.	437	Master-Bilt Refrigeration Mfg. Co.	729			Worthington Corp.	123-24-26
		Maurey Mfg. Corp.	140			York Corp.	643-44-45-46



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Reputation of a product-line is established by the experience and integrity of the name-behind-the-product.

Members of the Dunham-Bush family offer assurance of a dependable product reputation backed by more than a century and a half of combined heat transfer experience.

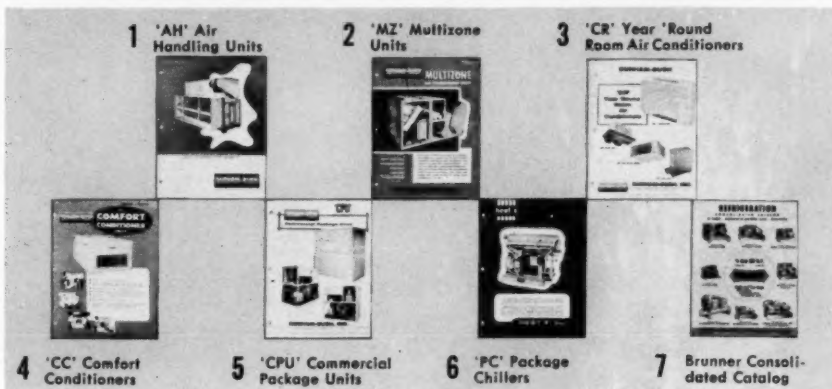
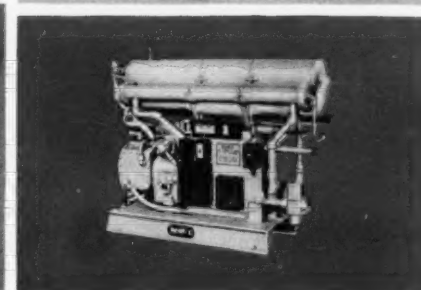
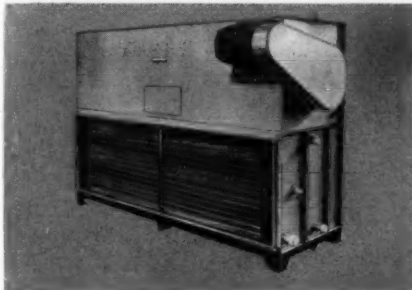
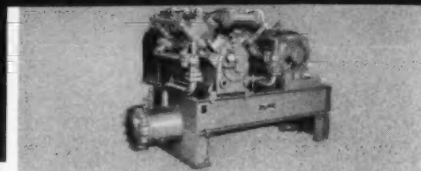
Perpetuating fine product reputation is the Dunham-Bush sales engineer. His technical skills are ever available to aid you in three major industries.

May we send him your way for a courtesy call?

167 YEARS OF COMBINED HEAT TRANSFER EXPERIENCE

AIR CONDITIONING

Whatever your requirements in Air Conditioning equipment, there's a dependable Dunham-Bush unit to satisfy the specification. 'AH' Central Station Air Handling Units, 'MZ' Multi zone Units, 'CR' Room Air Conditioners, 'CC' Comfort Conditioners, 'CPU' Pre-Engineered Commercial Package Units, Direct Expansion, Water, Steam Coils, Cooling Towers, Evaporative Condensers, Heat-X Package Chillers to 100 tons, Brunner Condensing Units to 100 tons. These are the "basics" from the Dunham-Bush line to make your Air Conditioning jobs trouble-free, simple to specify. Request catalogs by number.

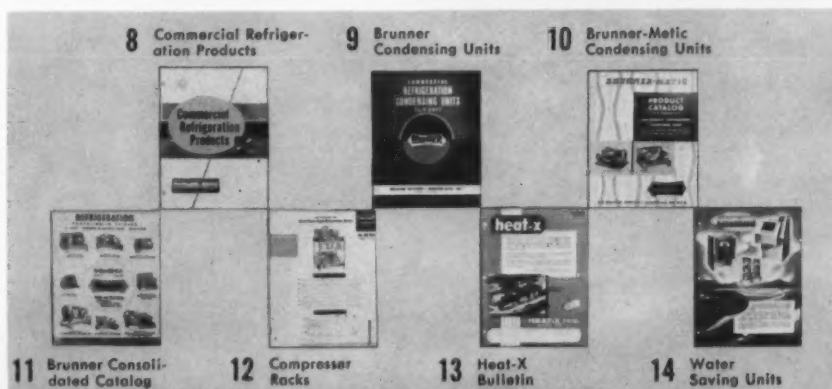
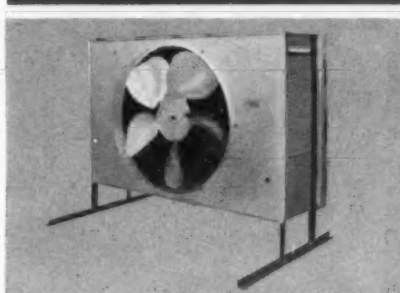
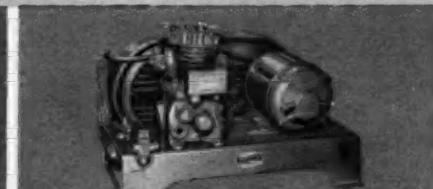
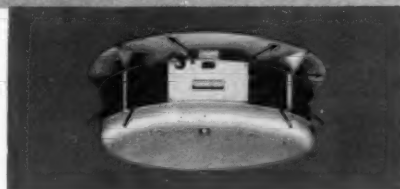


DUNHAM-BUSH

ONE SOURCE...

REFRIGERATION

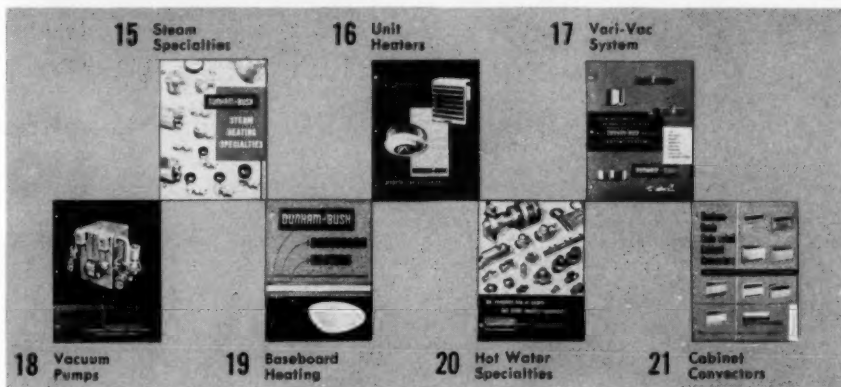
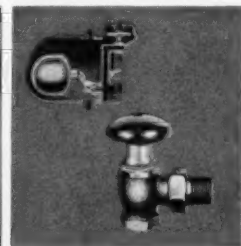
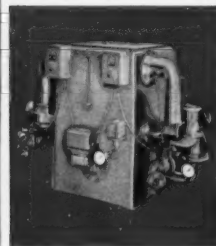
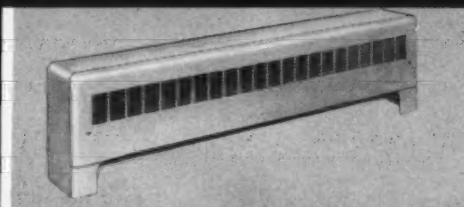
Normal temperature operation or low temperature operation, you'll find Dunham-Bush *the complete line*. Brunner Condensing Units, semi-hermetic from ¼ H.P. to 7½ H.P. or open-type units ¼ H.P. to 100 H.P., offer you top performance and selectivity. Dunham-Bush unit coolers, plasti-coolers, Electric defrost, and other low temperature units, together with the full line of Heat-X liquid coolers, heat-interchangers, condensers and other important "links" for a well balanced refrigeration system, make your task simple with this "one source" line.



HEATING

Dunham-Bush gives you "supermarket shopping" for ALL your heating needs. Not one but every heating product you need (except the boiler) is manufactured by Dunham-Bush.

One order brings you the world's finest baseboard, convectors, radiation products, cabinet unit heaters, propeller fan and blower type heaters, vacuum and condensate pumps, complete lines of steam and hot water specialties, complete controls for industrial and home heating systems.



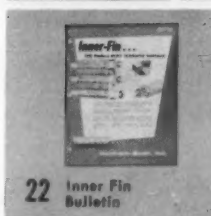
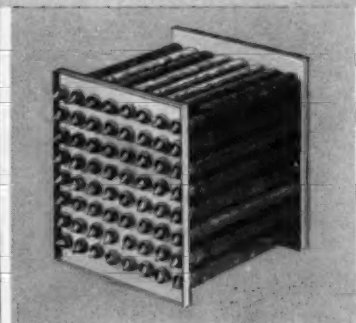
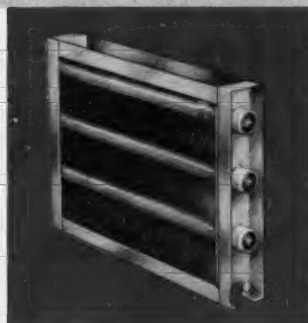
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SPECIALIZED HEAT-TRANSFER

Over a century and a half of heat transfer experience is available to help solve your specialized heat transfer problem.

Industrial, Chemical, Aviation, Electronic—these are but a few of the fields in which Dunham-Bush engineers have exhibited their talents.

Oil Coolers, Aftercoolers, Air Compressors, LP Gas Transfer Units, specialized Inner-Fin Heat Exchangers—these are but a few of the products available in the complete Dunham-Bush line.



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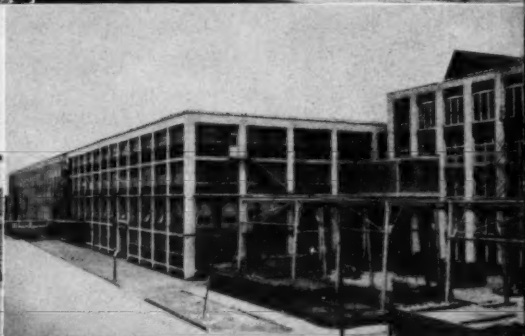
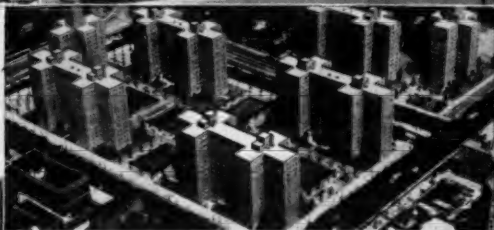
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*products on
the job*
EVERYWHERE



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Utility Fan Unveils Pink Blower Housing

LOS ANGELES—The lavender and old lace influence is catching up with the factories.

Utility Fan Corp., manufacturer of air blower fans for factory air conditioning and ventilating equipment, unveiled a new color item here—a flamingo pink (correct) blower housing.

Blower fan blades have been painted red for some time as a precaution, said Manager Vance Smith, but painting the housings pink to make them psychologically more attractive for women workers in customer plants is something new.

"Studies show that women work better and harder," said Smith, "in esthetically pleasing surroundings. Plant color is a step in that direction."

The utility fans also come in a handsome masculine grey, he added.

'Biggest We've Ever Had' Is NAHB Show Promise

WASHINGTON, D. C.—"Biggest exposition we've ever had" is promised by the National Association of Home Builders for Jan. 19 to 23 in Chicago.

A total of 781 exhibit spaces will be used for the 1958 exposition, NAHB said. More than 50 exhibitors will be showing their products for the first time.

As in the past, the exposition will be divided between the Coliseum and the Conrad Hilton and Sherman hotels. The association's annual convention will run concurrently.

Hotel and motel reservations are being handled on a first come, first served basis for those who register in advance and pay the registration fee: \$15 for men, \$10 for women.

Free shuttle bus service between exposition centers is planned.

Cassatt Gets One York Post, Not Werden Both

A typographical error in a page 1 story in the Nov. 11 issue of the NEWS on appointments announced by York Corp. made it appear that Robert G. Werden had been named to two different positions.

The story stated incorrectly that Werden had been appointed general sales manager of packaged products. Actually, Robert E. Cassatt is now the general sales manager of York packaged products.

As correctly reported, Werden was named general sales manager of engineered equipment for York.

G-E Heat Pump Distributor's Booklet 'Gets Good Dealers, Makes Them Known'

ROANOKE, Va.—Richardson-Wayland Electric Co., local General Electric Co. Weathertron heat pump outlet, has developed a dealer-getting program claimed not only to secure good new dealers but also to make them well-known to prospects within the first few weeks of operation.

Conceived by Oliver Strawn, sales engineer of R-W, the entire program is explained in an attractive booklet which sets out for dealers exactly what R-W will do to launch them in business.

Individually prepared for each prospective dealer, the booklet gives many facts about the dealer's trading area, tells how many family units there are in the territory, what their average family income is, and

how many earn more than \$7,000 a year. Also included are electrical rates and local data of importance.

R-W will co-sponsor the new dealer in an Open House together with demonstrations of the Weathertron heat pump to special groups. An operating heat pump, wall banners, and literature are made available to the dealer for his open house, and each phase of the open house program is announced by newspapers advertisements in local papers and spot radio announcements.

Besides that, in several cases, the local radio station has scheduled a 15-minute interview with dealer personnel because of the newness of the heat pump in the area, the distributor explained.

MARCO MOTORS

Powered more air conditioners
during the 8-year period of
the industry's greatest growth because:

**Performance 99.44% perfect
in the field!**

Multiple speeds are WOUND IN!

Marco Motors pass the RAIN test!



MARCO INDUSTRIES, Inc.
WOMELSDORF, PENNSYLVANIA

the only company devoted exclusively to the manufacture of motors for the Air Moving Industry.

For more information about products advertised on this page use Information Center, page 59.

Installation, Service Facilities Termed Key to Success

'Clogged Filters, Fan, Motor Bearings Run Dry, Stretched, Frayed Belts, Refrigerant Leaks, Continuous Overload All Punish Air Conditioners'

SAN FRANCISCO—"The key to your continuing success in the air conditioning business will be found in your installation and service facilities," Jack Ward, president of Edward B. Ward & Co., Carrier distributor here, told members of the National Warm Air Heating & Air Conditioning Association at a meeting here.

Ward advised the dealers what assistance they should expect from the manufacturer and distributor in establishing those facilities and in training service personnel.

"Poor performance on the part of your sales force will reduce volume and profits, but poor performance on the part of your service departments can quickly destroy your entire business. Nothing can do you more harm than a dissatisfied customer.

'Service Can Cover Multitude of Sins'

While it's true that poor engineering is often to blame, a good service organization can cover a multitude of sins in this connection. And even with the best engineering, an air conditioning system will soon take on all the aspects of a sour job unless it is properly maintained and serviced.

"Consider, if you will," Ward added, "the punishment that can be inflicted on an air conditioning unit. Unlike a domestic refrigerator, where the load is pretty closely controlled by the cabinet door, an air conditioning unit can and usually is continuously overloaded.

"It's filters can be left clogged with dirt. Its fan and motor bearings can run dry. Belts can stretch and fray. And, in the case of the room air conditioning units, most of the machinery is exposed to the elements.

"In self-contained equipment, limitations of space, weight, and costs, will dictate motors loaded to the point where they cannot handle it under normal power or load conditions.

"You are subject to the refrigerant leakage due to breakage of lines caused by vibration. Air quantities are usually always up to the limit of acceptable noise levels. There are two or three motors—one of at least ½ hp.—calling for complex wiring in control systems," Ward pointed out.

'Units Still Aren't Plug In, Forget Type'

"So, in spite of the great strides made in recent years by manufacturers of air conditioning equipment, the air conditioning unit cannot, as yet, be placed in the category of 'plug it in, set it, and forget it,' because, if you do, it will surely boomerang with a vengeance," he warned.

To provide the proper service,

responsible for technical advice on service problems, through correspondence, and he should issue service news, training bulletins, and make training aids available in the field.

"The field services of a manufacturer should consist of regional field offices, staffed with highly trained service supervisors, whose first responsibility should be to render technical assistance on trouble-jobs.

'Mfr. Should Assist In Resolving Complaints'

"And, believe me," Ward stressed, "you are going to have them if you are going to get into this business. You cannot avoid them.

"The manufacturer should assist in conducting training

meetings, and he should assist you in resolving customer complaints.

"These services are most important. Indeed, they are vital to the operation of a good service department. And you, as a dealer or contractor, on the firing line, are entitled to assistance of this type.

"The moral of these remarks," Ward categorized, "is that you should investigate the manufacturer of the products you plan to handle and make sure that he has these facilities available—either directly, or through distributors.

"If the air conditioning products you plan to handle come to you through a distributor, scrutinize the facilities of this distributor.

"Does he have trained service personnel? Is he capable of assisting you in training your own service people? Is he basically experienced in air conditioning? The availability of such facilities

ties from either the producer or his distributor will be of immeasurable assistance in your own service problems," Ward advised.

'Air Conditioning Serviceman' Unique'

"But this is only one part of the problem. The most difficult hurdle you will encounter will be one of personnel. Believe me, a good air conditioning serviceman is a very unique type of craftsman," he avowed.

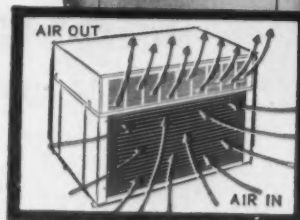
"First—in refrigeration. Secondly, in plumbing, in all of its aspects—hot water, cold water, and pumps. He must know steam and steam specialties. He must be acquainted with gas, both natural and LPG.

"He should know electricity, both power wiring and control wiring, and the theory behind it. He should know controls, their inner workings, both electric and, if possible, pneumatic. (Concluded on next page)

NEW from the



A whole new world of installation possibilities is opened up with the new Lennox condensing units. You can bury them in walls, building foundations, carports, or put them out in the open. Optional hood provides for air intake and discharge on the same side, with no possibility of re-circulation. There's no danger of killing shrubs or scalding grass. Without hood, air can be ducted in and out.



MARSH Instruments

THE SERVICEMAN LINE of Testing Gauges, Testing Thermometers, Timers, etc.
PRESSURE GAUGES and Dial Thermometers for all services.
MARSH-ELECTRIMATIC, Water Regulating Valves, Solenoid Valves.
MARSH INSTRUMENT COMPANY
Sales Affiliate of Jax. P. Marsh Corporation
Dept. O, Skokie, Ill.

'Service Is Key to Success' --

(Concluded from preceding page)

He should at least have a nodding acquaintance with sheet metal. And, finally, it is most desirable that he have an eye out for sales, because he can be a source of continuing business.

"You surely won't get such a man from the union bench," Ward cautioned. "And you will have much difficulty in wooing one away from your competitor."

'Look Within Your Own Organization'

"Usually, you must look within your own organization. Select the younger, rather than the older man—the ambitious one rather than the one just content to put in his eight hours."

"Call on the distributor or manufacturer of the products you handle and start training him. This training is essential, and must be continued."

"After the fundamentals are mastered, he must acquaint himself with all the existing products you handle, and, of course, with new products as they are released," Ward explained.

"While the primary efforts in this program should stem from your distributor or manufacturer, other manufacturers allied with the air conditioning industry, such as the welding and brazing industry, valve makers, stand willing and, indeed, anxious, to assist in this training program. They have the training aids and personnel to help you."

"Insist the distributor and manufacturer do their part in training your personnel, because in this expanding industry of ours, the only answer to the personnel problem is training."

Ala. Wholesaler Opens Forms Refrigeration Service Firm In Ohio

MOBILE, Ala.—Mobile Supply Co., 2694 New Highway 90 west, is one of the newest wholesale distributors of air conditioning and heating units in the city, it has been announced.

Opened for business several months ago, the company operates under a partnership. Partners are Gene Gwin and Embrey Thares, general and office managers, respectively, and Barto Brown and Earl Brown of Birmingham. The Browns operate another firm in that city.

The Mobile firm is the exclusive distributor for Bryant air conditioning and heating equipment in southern Alabama, northwestern Florida, and southern Mississippi. The majority of the firm's business is supplying contractors with materials and equipment, it was explained.

TOLEDO—Formation of Allied Industrial Service Corp., which will install and service air conditioning, refrigeration, process control, ventilation, and water economizing systems, has been announced by Robert Greenwald, president of the new firm.

The firm has absorbed the facilities and personnel of Arctic Refrigeration Co. The former owner, Robert N. Christy, will be service manager of the new concern, which will be located at 1407 South Ave.

Greenwald was formerly manager of the air conditioning division of Lumm Corp. Earlier, he was chief engineer of air conditioning for Hausman Steel Co. He is president of the local chapter of the American Society of Refrigerating Engineers, it was stated.

Recold Appoints Hawk Representative In East

LOS ANGELES—Frank C. Hawk has been named Recold's representative for New York,



New Jersey, Pennsylvania, and the New England states, announces H. T. "Hy" Jarvis, president of Recold Corp.

Hawk will headquarter in New Jersey and will eventually open sales offices throughout his territory. A Recold warehouse will be located in New Jersey to serve the New York-New England-Philadelphia trading area, as well as the Washington, Baltimore, Richmond trading area to the south.

Hawk has been associated with the heat transfer industry since 1935 when he graduated from Lehigh university with a Bachelor of Science degree in thermodynamics. He is a licensed professional engineer.

Arkla Adds 4 Directors

EVANSVILLE, Ind.—Arkla Air Conditioning Corp., which recently purchased the Air Conditioning Div. of Servel, Inc., added four new directors at a recent meeting of the board here.

They are: L. L. Baxter, Fayetteville, Ark., president of Arkansas Western Gas Co.; W. W. Selzer, New York City, director of business promotion for Columbia Gas System Service Corp.; S. R. Walker, Fort Smith, Ark., president of the Fort Smith Gas Corp.; and C. H. Zachry, Dallas, president of Southern Union Gas Co., and the immediate past president of the American Gas Association.

Other directors previously elected are: W. R. Stephens, Little Rock, Ark., who also is chairman of Arkla's board; J. C. Hamilton, Shreveport, La., president of the company; D. W. Weir, Shreveport, vice president and manager of operations; E. N. Henderson, vice president in charge of research and development; and D. P. Raney, Little Rock, investment executive.

Firm Chartered

NEW ORLEANS—Schulin's Refrigeration, Inc. (air conditioning units, refrigeration equipment, and major appliances), 3650 Havana St., has been granted charter of incorporation listing capital stock of \$10,000.

Reprints Available

Hermetic Compressor Design, Development, by Henri Soumerai. Only 40¢ each.

Mail this ad with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

AIRO stands for

Speedy, dependable, world-wide service.

Air Conditioning and Refrigeration parts, equipment, supplies.

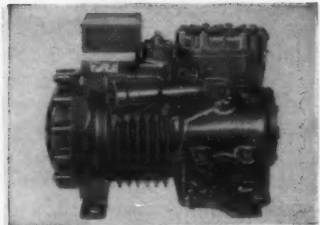
Write for Wholesale Catalog No. 57

AIRO SUPPLY CO.
2732 N. Ashland Ave., Chicago 14, Ill.

SOUND up!

NEW 4-TON CONDENSING UNIT...

full 48,000 Btu/h capacity (with 95° air entering condenser)

Another **LENNOX** First in Air Conditioning Design!

NEW "JOB-MATCHED" COMPRESSOR

The Lennox super quiet and serviceable compressor was built for this specific 4 ton unit—the same rugged, durable semi-hermetic design that has set new standards of quiet, economical, trouble-free operation under the toughest operating conditions in the field.

For those 3½ to 4 ton loads — where you've been forced to install 5 ton units at substantially greater cost — here's the perfect answer. The all-new Lennox 4-ton unit has been designed to fill this gap in equipment sizing. Now Lennox offers air-cooled equipment — years ahead in design — in these Btu/h sizes: 23,300; 34,100; 39,250; 41,700; 48,000; 58,100; 82,000; and 114,000 . . . each one honestly and conservatively rated at 95°, A.R.I. standard conditions.

It's another reason Lennox Comfort Craftsmen have the solution to every air conditioning problem.

MAIL THIS COUPON TODAY FOR FURTHER FACTS...

LENNOX Industries Inc.

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Marshalltown, Iowa • Columbus, Ohio • Syracuse, N. Y. • Fort Worth, Texas
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Address nearest factory. See locations at left.

Please send me additional information on the "new from the sound up" Lennox 4-ton Air Conditioners.

I understand there is no obligation on my part.

Company.....

Address.....

City..... State.....

My Name.....

Airtemp Air Conditioners for '58--

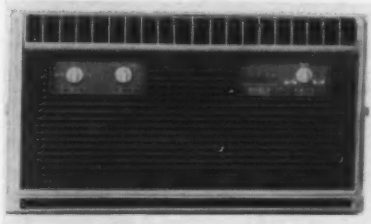
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tional, double-hung windows, one for casement windows, and one for built-in or through the wall installations.

Feature-wise, the line is divided into two categories: "Custom" and "Custom Royal" or "Imperial." Imperials are the in-the-wall units.

All Custom models include automatic thermostat as standard equipment.

The Custom Royal and Imperial models all include automatic thermostat, ventilating control, exhaust control, and speed fan as standard equipment.



Airtemp Custom Royal window air conditioner.

Nine models are designed for double-hung windows. There are five custom models in $\frac{3}{4}$ and 1-hp. sizes and four Custom Royals in 1, $1\frac{1}{2}$, and 2-hp. sizes. All can be flush mounted or extended into the room.



Airtemp 1-hp. casement-window air conditioner.

One Custom 1-hp. model (1600-26) features reverse cycle heating on 12-amp., 115-volt operation.

One Custom 1-hp. model (1600-24) and one Custom Royal 1-hp. model (1600-19) offer 7-amp., 230-volt operation.

The casement line offers four models in $\frac{1}{2}$, $\frac{3}{4}$, and 1-hp. sizes. Three are Custom Royals and one—the $\frac{1}{2}$ -hp. unit—is a Custom. The Custom and the Custom Royal model 1775-7 feature $7\frac{1}{2}$ -amp., 115-volt operation.

Casement models can be mounted like a screen in minutes, Airtemp claims. For installation they require neither pane removal nor window alteration. Totally enclosed with-



AIRTEMP gas-fired furnace features functional styling and measures only $57\frac{1}{2}$ in. in height. Pictured model is equipped with cooling coil (top portion of furnace is coil case) and can serve either as a winter or summer air conditioner.

in the room, they do not interfere with window opening or closing.

Imperials are offered in four models, a $\frac{1}{2}$ -hp., a $\frac{3}{4}$ -hp., and two 1-hp. units.

The entire line features grilles adjustable for four-way directional air control, large filter areas, quiet operation, new mounting kits said to reduce installation time on conventional units by as much as 60%, and a five-year warranty covering the entire refrigeration system.

Gas Furnace Features Deep-Sweep Burner

The new deep-sweep burner in the gas furnace line, perfected by Airtemp engineers, produces a flame that is shaped to the exact contour of the furnace heat exchanger.

The "contour flame" is first directed downward, heating initially the entire lower portion of the heat exchanger. It then curves upward following the vertical contour of the exchanger. All heat transfer surface is utilized.

Heat transfer begins immediately at the bottom portion of the exchanger where air turbulence is the greatest. There are no cold spots over which air from the furnace blower must first pass before it begins to warm.

Furnace Height Reduced to $57\frac{1}{2}$ In.

Development of the burner has permitted furnace height to be reduced to $57\frac{1}{2}$ in. The furnace occupies only 4.3 sq. ft. of floor space.

Other features include:

New type gas manifold control assembly whose components, including electro-magnetic gas valve, pressure switch, and pilot switch, can be serviced or replaced individually without disconnecting main gas line.

Improved non-linting pilot located close to burner.

Easy filter replacement without removing top panel.

Slide off type draft diverter which can be removed without damaging seal between circulating air flue gases.

Corrugated heat exchanger, permanently lubricated blower bearings, enclosed safety controls, and separate fan and temperature limit controls.

Matching rear return or top inlet side return ducts are available for all models.

All models are engineered to accommodate—at minimum cost—the addition of a cooling coil.

... Your best motor investment is Century



Are you sure the electric motors you buy are the best you can get for your money?

The best motors are those which give you the longest service with trouble-free performance. In your factory, that means less downtime and lower production costs. For that reason, Century builds motors that do the toughest jobs in industry.

Standard Century motors are built to the requirements for continuous use. If you're a user of electrically powered equipment, you get this Century industrial quality regardless of application, and at no extra cost. Here's a real plus-value for you.

Look into the reasons why your best motor investment is Century.

Century

MOTORS

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri • Offices and Stock Points in Principal Cities

New Approach to the Public?

Conditioning Systems Must Appear Something Other Than 'Hungry Dragons Eating Up Dollars', BHC Told

NEW YORK CITY—Need for the hydronics industry to establish a "psychological franchise" and a "dynamic industry personality" to insure an increasing market for its products was emphasized at the second annual meeting of the Better Heating-Cooling Council here by Irving Gilman, vice president of Institute of Motivational Research, Inc.

The council is composed of manufacturers, wholesalers, and contractors engaged in hydronics—the science of heating and cooling with water.

Gilman told them that today a series of "stereotyped prejudices, blocks, and walls exist between the industry and the consuming public."

Consumers see their home heating systems "not as friends which provide them with warmth and shelter, but as hungry dragons eating up fuel dollars."

For an answer, Gilman suggested the need to break through these misconceptions and find out "not only what the consumer says but what he does," about the product.

What Must Be Known

The industry has many questions to answer, he felt. Chief among these is to discover what the competition is, what makes brand loyalty patterns for both an industry and a company, what makes for differences in consumers, how to find out who are the real authorities that push a product, and what are the unsatisfied needs of consumers.

Finally, Gilman said, it was necessary to "interpret the psychological heart of the product, its personality in the minds of consumers."

Sherman Rogers, copy chief, Anderson & Cairns, Inc., picked up where Gilman left off. He stressed the challenge of modern advertising as it should be applied to the hydronics field.

The industry has to learn that advertising nowadays has to be aimed at "what your market wants to hear, not what you want to say."

This principle of "You-man-ship" as opposed to "We-man-ship" was the key to advertising sales appeal. Unlike the "tell-all industrial copy of 20 years ago," which was a cure for insomnia, and was "repeated... and repeated," until it had all become exactly alike and the audience was numb. Modern advertising methods have a sounder appeal.

What'll It Do for Him?

"It's a different story when you reach out to your prospect with what he wants to hear: What he has to gain from your product."

Rogers asserted that the industry should bear this in mind when planning an advertising message, by appealing to the emotion "that you know will move your customer."

The business meeting, attended by representatives of each of the council's member companies, also heard an up-to-date report by John C. Adams, American-

Standard, on the recent Women's Housing Congress, held in Washington, D. C.

BHC was a prime organizer of the congress and one of five trade associations that sponsored the event which drew 100 women from 45 states.

Women's Congress Results

"We tried to find out, first, what women really thought about heating and its contribution to the family's welfare, and second what they liked and disliked about the heating systems they had in their homes," said Adams.

The results, he noted, were extremely informative and valuable to the industry. The housewives declared heat was "ex-

tremely important" to family harmony, comfort, and health.

Most women in attendance had hot air heat but "were not happy with it." They cited dust, dirt, and hot and cold spells as the chief contributors to discomfort.

On the other hand, those women delegates who had hot water were more than satisfied with it and some thought it "simply wonderful."

BHC President John E. Reid, who is president of Sterling Radiator Co., Inc., Westfield, Mass., predicted a sales increase in the hot water heating industry in the 1960's as a result of the groundwork now being laid through large-scale preparation and promotion by the industry.

How Industry Fared

Though housing sales are expected to be down about 11% for 1957, he noted that sales of baseboard radiators of all types have dropped only about half that amount, 5.7% during the first seven months of 1957.

"We are undergoing a rolling readjustment," he said. But because of the concentration of the hydronics industry on sales problems, he felt that a bigger share of the market could be expected in the next decade.

Programs for 1958

Such concentration, he declared, is reflected in the council's far-ranging, comprehensive program which will help assure an "extremely bright" business future.

As part of that program, a new color cartoon movie aimed at arousing the public to the benefits of hydronics is expected to be ready in December, it was

reported. The movie will be shown on 300 television stations next year, according to present plans.

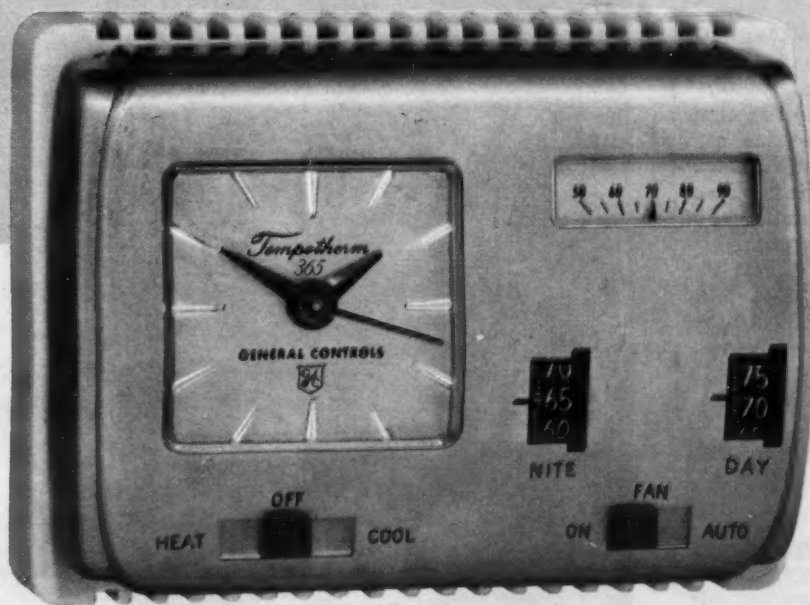
Members agreed to an additional press run of 20,000 copies of the consumer booklet "Heart of the House" to meet public demand. The initial run of 25,000 copies is nearly exhausted.

Sears To Sell Trion Home Air Cleaners

McKEES ROCKS, Pa.—Sears Roebuck & Co. has arranged to sell Trion residential air cleaners, Trion, Inc. announced here.

President E. W. Myers, Jr. discussed the deal made with Sears in his letter to stockholders recently. He quoted Lewis L. Doughton, general manager of Sears' north central zone as stating, "We believe the electronic air cleaner will be the next big home appliance."

FOR YEAR 'ROUND AIR CONDITIONING...



THE NEW ADVANCED DESIGN



Tempotherm 365

General Controls thinks you will agree the new Tempotherm 365 is the finest temperature guardian ever developed for year 'round control of both heating and cooling. For the first time, automatic clock control of night setback and morning pickup for heating is combined with the identical advantages for cooling. Now, automatically lowered night temperatures permit better humidity control and help to offset the load of maximum daytime temperatures.



The Tempotherm 365 is engineered to develop the full potential of modern day air conditioning installations. Its beauty and workmanship will delight the homeowner...and its clock-controlled operation brings satisfaction 365 days a year. Our field organization is prepared to demonstrate the advanced design and effectiveness of this new temperature control instrument.

Five Plants:
Glendale, California
Burbank, California
Iron Mountain, Michigan
Skokie, Illinois
Guelph, Canada



GENERAL CONTROLS

America's Finest Automatic Controls for Home, Industry, and the Military
40 Factory Branch Offices Serving the United States and Canada

Master Control Panel Permits Nurse To Reset Operating Room Temperature To Conform to Physician's Wishes by Turning Knob

ATLANTIC CITY, N. J.—An electronic control system that enables a surgeon to remotely regulate temperatures in the operating room during surgery was unveiled recently at the American Hospital Association convention here.

Without taking his eyes from the patient, the physician steps on a foot pedal beneath the surgery table which rings a bell on a telephone located on a control panel at the remotely-located supervisory nurse's desk. His voice is picked up by a sensitive microphone located in the ceiling as he requests a temperature change.

INDICATOR SHOWS TEMPERATURE

From her desk, the nurse can instantly obtain the temperature in the operating room by pushing a button on a control panel and reading an indicator in front of her. She is able to reset the temperature to conform with the doctor's wishes immediately by turning a calibrated knob.

The system, developed by Minneapolis-Honeywell and known as a "Hospital-Master," gives a supervisory nurse complete control over heating and air conditioning in such critical areas as the operating room, obstetrical department, and psychiatric detention rooms.

Operating "brain" of the Hospital-Master is a 5-ft.-long panel attached to the nurse's desk. It contains pushbuttons, indicating lights, knobs, and a telephone. The intercommunications system normally employed between the surgery room and supervisory nurse is integrated with the panel.

'SIMPLIFIES, SPEEDS TEMPERATURE NEEDS'

"The Hospital-Master simplifies, expedites, and reduces the cost of satisfying the widely-varying temperature requirements in critical hospital areas," B. C. Benson, Honeywell hospital sales manager, said.

"In the operating room particularly, surgeons need indoor climate adjustments speedily during the course of an operation to protect the patient's health and also to clear the air of medicinal odors."

In most hospitals today, he pointed out, comfort equipment is located in the basement and is supervised by maintenance personnel. Delays in adjusting temperatures in such remote areas as the operating room, for example, are inevitable.

In addition, each occupant in the operating room is busily occupied and cannot spare the time to reset a temperature control in the room itself. It would not be permissible in any event since the surgeon and his staff must remain surgically sterile.

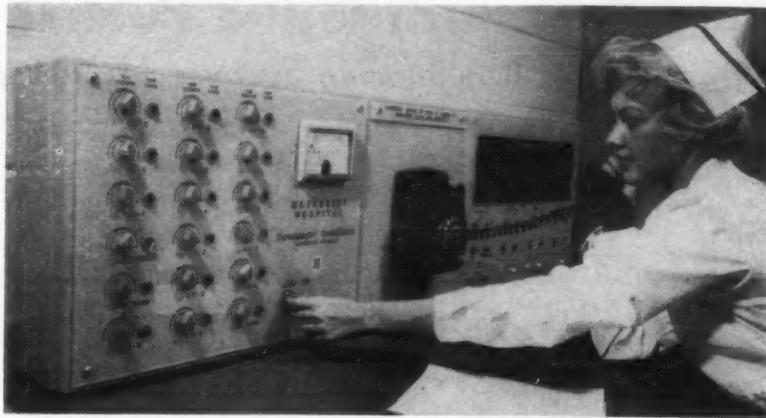
The Hospital-Master also solves a major problem encountered in psychiatric detention rooms, Benson further stated.

PREVENTS PATIENT TAMPERING

It is the need for temperature control equipment not subject to tampering by detained patients.

By placing an electronic sensing element in the comfort system's ductwork, temperatures can be controlled in individual rooms from the supervisory nurse's control panel. She also can communicate with the patients by using the control panel telephone and then remotely satisfy their temperature desires.

AUTOMATION concepts are utilized in this new Minneapolis-Honeywell control panel for specialized hospital areas. A surgeon can step on a foot pedal beneath the surgery table which sounds a bell on the control panel located on the supervisory nurse's desk. He requests a temperature adjustment by speaking into a microphone located above the surgery table. The nurse obtains the surgery temperature from an indicator and resets it to conform with the physician's wishes.



When you're a Trane
Trane supplies
you run your



SO QUIET you hardly know it's there! These compact 3 through 15-ton de luxe models pack cooling comfort into a trim, slim modern package. And they're quiet! Exclusive TRANE "iso-sound" design has fan section and compressor section floating independently on sound and vibration isolators for the smoothest, quietest operation ever!

GO AFTER THE BIG ONES! These 10-15-20-ton commercial sizes may be installed outside the conditioned space for use with ductwork, if desired.

Circle No. 13 on Reader Service Card



Architectural Forum Predicts

'58 Will Be Good Year for Builders—Up About 3%

NEW YORK CITY—1958 will be a good year for builders, reports *Architectural Forum*.

The building magazine's annual forecast sees dollars spent for new construction edging up about 3% to a record high of \$48.7 billion next year. Author of *Forum's* forecast is Washington construction economist Miles L. Colean.

However, *Forum* expects

parts of the construction picture to be weaker. In the commercial-industrial sector the outlook is for a 4% dip. The climb in office construction will level, and store building will continue to decline.

But a rise of almost 9% in public building should more than make up for dips in private activities, according to *Forum*, with the result that physical

output will climb. Public construction—about 78% of it by state and local government—is expected to top \$15.4 billion. Only military building will show a decline in this category.

Other building fields that will show increases include churches, schools, hospitals, and utilities. In fact, says *Forum*, "the boom in religious buildings probably makes this the greatest church

building era in history."

"Construction is the reflector, rather than the generator, of general business conditions," notes the magazine. There is no question that construction costs today are high . . . and clearly, construction has not been increasing its productivity sufficiently to make up for the mounting cost of labor. But during 1958, costs should show greater stability and materials prices will give little or no push to the cost index.

Credit will still be a problem in 1958 though not as great a

one as in 1957. In the main, problems of costs and credit will leave their heaviest marks in the private sector of building.

"It won't be a terrific year for building, but it will be good," the editors conclude.

Sees '57 Heat Pump Installations Beating All Years Combined

HUDSON, Ohio — Heat pump installations in the United States this year will exceed in number all units already installed, the magazine *Building Products*, predicted.

In a special report published in its August issue, the report stated that sale of around 12,000 heat pumps are expected this year with approximately 60% of the units going into new homes.

By the end of 1959, it added, industry leaders expect a minimum of 100,000 heat pumps will be in operation in almost every state of the union.

Surveying builders, architects, utility officials, and manufacturers the magazine found that 14% of the builders and architects contacted have already tried the heat pump with favorable results and another 15% intend to install their first units this year. Utilities were found to be promoting heat pumps in all sections of the country.

Study Turkey Fertility In Conditioned Poultry House

BELTSVILLE, Md.—To study the effect of light and other environmental factors on turkey fertility, the U. S. Department of Agriculture has constructed an air conditioned poultry house at its research center here.

The structure embodies facilities that will enable poultry scientists to provide any climate required for turkeys in various experiments.

Los Angeles County Can Use Own Workers For Some Remodeling

LOS ANGELES—A bill recently signed into law by Governor Goodwin Knight permits the County of Los Angeles to do remodeling work valued up to \$50,000 with its own forces if plans of the original building are not available.

Because of appeals by general contractors and subcontractors that the governor veto the bill, the governor signed it only on condition that the County of Los Angeles would agree to an advisory committee composed of general and subcontractors who will review any proposed remodeling by the county before it can undertake such work with its own forces.

Self-Contained Dealer... the equipment... business as before

*Sell self-contained units from 3 to 20 tons...
plus the complete Trane line...with no
quotas, no minimums, no domination!*

Air conditioning contractors and dealers who have become TRANE Authorized Dealers have discovered that they have *complete business freedom*. They have no set sales quotas . . . no personnel requirements . . . no manufacturer domination. These dealers know that TRANE supplies them with the finest equipment—and they continue to run their business as before!

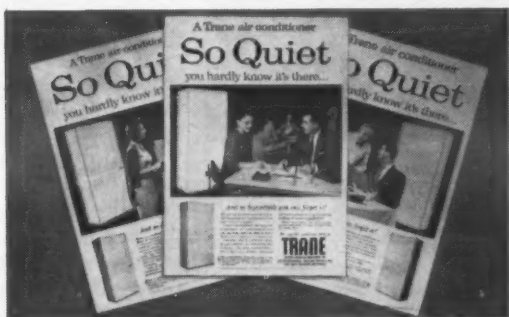
And the new TRANE Self-Contained units from 3 to 20 tons are the finest ever. Backed by these units—and the complete TRANE lines of equipment from 3 to 1500 tons—TRANE Authorized Dealers can go after any air conditioning job—any size, any type—and make a profit. And they're backed by a recognized leader in air conditioning equipment—supported by powerful national advertising and promotion programs.

Ask your nearby TRANE Sales Representative now about all the extra advantages you'll have as a

TRANE Authorized Source. Or write directly to TRANE, La Crosse, Wisconsin.

HERE'S WHY IT WILL PAY YOU TO TURN TO TRANE:

- **COMPLETE LINES!** Competitively-priced equipment for any air conditioning job is available to you as a TRANE Authorized Installer for packaged equipment.
- **A LEADER IN THE INDUSTRY!** TRANE is well known for outstanding air conditioning equipment . . . the famous TRANE CentraVac, UniTrane units, compressors.
- **SERVICE HELP!** You'll have a trained serviceman *right in your own market* . . . not halfway across the country!
- **COMPLETE BUSINESS FREEDOM!** TRANE supplies the equipment, you run the business! No set sales quotas . . . no inventory minimums . . . no required amount of local advertising . . . no personnel requirements. You have complete freedom of action in buying and selling.
- **NATIONWIDE SALES FORCE!** A network of offices in 96 cities works with architects and engineers to help obtain favorable specifications and over-all company acceptance.



NATIONAL ADVERTISING in Newsweek, Business Week and other leading magazines helps pre-sell TRANE equipment for you.



COLORFUL LITERATURE, booklets, catalogues, posters and decals—plus signs for use at installation sites—help you sell!

For any air condition, turn to

TRANE

MANUFACTURING ENGINEERS OF AIR CONDITIONING,
HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

THE TRANE COMPANY, LA CROSSE, WIS. • SCRANTON MFG. DIV., SCRANTON, PA • TRANE COMPANY OF CANADA, LTD., TORONTO • 96 U. S. AND 19 CANADIAN OFFICES

Trying to find
the right man for a
hard-to-fill vacancy—
the NEWS' Classified
Ads are read by your
man.
Place your ad today!

Room Air Conditioners

For Distributors

'58 Amana Air Conditioner Line To Be Shown at Regional Meetings

AMANA, Iowa — Amana's new 1958 air conditioner line will be shown to distributors in a series of regional meetings to be held the early part of December, according to George C. Foerstner, executive vice president of Amana Refrigeration, Inc.

The announcement was made at a two-day meeting of Amana Distributor Air Conditioning Advisory Committee held at Amana. Tentatively, the schedule of meetings includes show-

ings at Amana, New York, Atlanta, Dallas, Los Angeles, and Portland, Ore.

A review of the 1958 air conditioning program and finalization of plans for dealer showings featured the group meeting. Members were also guests of Amana at the Iowa-Wisconsin football game.

Foerstner explained that this distributor advisory group on air conditioners was formed to help formulate a merchandising program and given the oppor-

tunity to pass on design and product features.

"It is an effort," said Foerstner, "to work as closely as possible with the people directly responsible for the sale of our products to the ultimate consumer. In the past, we have frequently consulted individual distributors; this merely organizes such consultations a little better. It is the second meeting in the past six months."

Buffalo Firm Formed

BUFFALO—A business name has been filed in the Erie County clerk's office for Moore Refrigeration & Air Conditioning Service, 146 Austin St., by Huran R. Moore.

List Buys 700,000 Glen Alden Shares

NEW YORK CITY—List Industries Corp., formerly known as RKO Theatres Corp., announced the purchase of about 700,000 shares of Glen Alden Corp. common stock at \$12.50 a share recently.

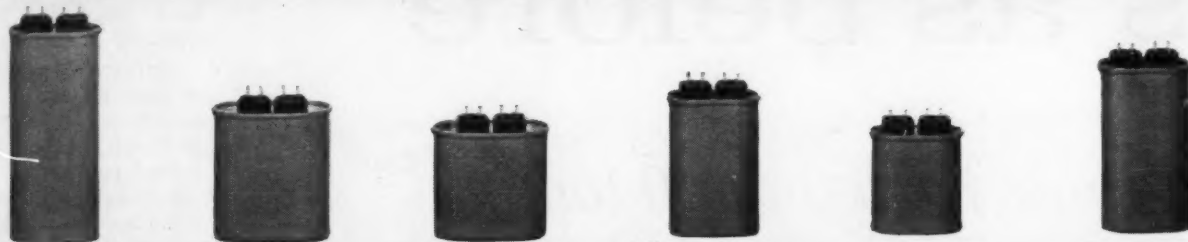
Glen Alden is parent company of Mathes Co., Inc., air conditioning equipment manufacturer. It is a diversified coal company with approximately 1,750,000 shares outstanding.

Officials of both List and GA expressed "satisfaction" with the move.



GETTING FANCIER ALL THE TIME are vacation trips awarded by various firms for outstanding sales accomplishments. Peter Donald, TV comedian and raconteur, was engaged as master of ceremonies for a program for 5,000 Fedders-Quigan award winning sales representatives on a recent vacation trip to the Bahamas. From left to right ready to board the plane are: Mr. and Mrs. Robert Brady—he's Fedder's assistant sales manager; Peter Donald; and Victor Melin, Fedders vice president and treasurer.

Select the best capacitor



for your air conditioner



from our complete line



448-4

CONTACT YOUR NEAREST APPARATUS SALES OFFICE OR THE CAPACITOR DEPT., FORT EDWARD, N. Y.

GENERAL  ELECTRIC

Fedders Preparing Winter Ad Campaign On Room Conditioners

MASPETH, N. Y.—The traditional spring kickoff for room air conditioner advertising is being set aside by Fedders-Quigan Corp. in favor of a winter campaign that will begin in December.

The early-bird program for the firm's 1958 line is twofold, according to Harold Boxer, advertising manager.

The first segment of the campaign is a double-page spread, presented in an editorial style, in the December issue of *Reader's Digest*. This is the earliest that the magazine has ever run an air conditioner ad.

The other phase employs local newspaper advertising on a cooperative basis with distributors. To insure that the copy will run during the winter months, Boxer stipulates that the ads must be placed by Feb. 28 if the distributor is to receive cooperative assistance.

The winter campaign will highlight the Fedders heat pump models, which heat as well as cool, with the theme: "Extra months of comfort for the price of summer air conditioning alone."

The *Reader's Digest* ad will be heavily merchandised. Reproductions of it will be used in newspaper mats.

Beginning mid-March, the starting point for previous Fedders national advertising, six separate color ads will appear in alternate issues of *Life* and the *Saturday Evening Post*. Also, *Parade* and *This Week* have been scheduled for two pages each, as well as insertions in the magazine sections of the *Chicago Tribune*, *New York News*, and *Philadelphia Inquirer*.

Get Your Share of Winter Profits!

on Room Air Cond. Covers

Send for the New 1957 Directory & Alphabetical Guide

Top Quality, Low Prices, Excellent Markup

JIFFY COVERS CORP.
614 Third Ave., N.Y. 16, N.Y.

Sees Air Cooled Condenser Widening Market Available to Refrigeration Supplies Wholesalers

FORT MONROE, Va. — The air-cooled condenser has earned its place in our industry, S. Charles Segal, sales manager of Kramer Trenton Co., told eastern refrigeration wholesalers meeting here.

It is no longer limited to the sizes we have had in the past, he declared. The wholesaler should not hesitate to figure and sell air conditioning to 300 tons.

"You have the opportunity to sell that type of equipment," he asserted. "If you don't do it, it will be sold, but through other sources. If you brush it aside, it is both a sale and a product you are losing."

Segal told the wholesalers that 120 tons of air-cooled equipment can now be put into an area measuring 13 by 15 ft. and 12 ft. high. As high as 360 tons of equipment can be connected to a single compressor, he added, and would require only 15 by 45 by 12 ft. of space.

How much air is needed for these large-size systems? Segal pointed out that modern air-

cooled equipment is designed to keep the air flow as low as possible and at the same time, keep the noise level at a minimum.

"There is no meter on the air," he said. "All we do is heat it up a few degrees."

With new improvements on air-cooled condensers, he added, high head pressure is no longer a problem. The problem now is

maintaining pressure at the expansion valve to operate the equipment properly when air temperature falls below design conditions.

Controls are now available, he said, to maintain head pressure and to make sure of starting the equipment when starting and stopping controls are based on pressure.

New Industrial Plant Gets Conditioning

PHILADELPHIA—Ace Engineering & Machine Co., Inc. here, manufacturer of shielded enclosures moved into its newly-completed plant in suburban Huntingdon Valley on Oct. 21.

The one-floor air conditioned offices and plant enclose an area of approximately 18,000 sq. ft., and house the executive offices as well as the firm's productive facilities.

Conditioner Firm's Salesmen Ride Cool And Have Cool Homes

INDIANAPOLIS — The six sales engineers of Bryant-Hedback Co., distributor for Bryant residential and commercial air conditioning equipment, practice what they preach. Each has his car equipped with air conditioning (Novi) and each has Bryant central air conditioning in his home.

Data Sheets Cover Filter Applications

WASHINGTON, D. C. — Two new data sheets "published in the interest of better air cleaning" by Air Filter Institute here have been issued.

"The Application of Electronic Air Cleaners" — two-stage electrostatic precipitators — is the first. It covers 17 factors to consider in the proper application of electronic air cleaners and offers a word on servicing.

Second AFI data sheet, "Streaking & Smudging Around Air Outlets," explains how soiling of ceilings and walls adjacent to air outlets and grilles has been a "touchy" subject in the air conditioning and ventilating industry.

Source of dirt from the primary and secondary or induced air streams is outlined. Maintenance of ceiling outlets is covered in the bulletin also.

AFI, at 300 Independence Ave. S.E. here, is composed of 15 filtering device manufacturers.

Trane Awards Contract For Clarksville Plant

LA CROSSE, Wis. — The Trane Co. announced that it has awarded the general contract for the construction of its new plant at Clarksville, Tenn., to the low bidder O'Brien and Padgett, Memphis.

The new \$1½ million plant will manufacture central-type residential air conditioning units, marking Trane's entrance into this field.

According to Richard Schiewetz, general manager of the Clarksville plant, the contract calls for the completion of the 150,000-sq. ft. manufacturing facility in 110 days, making the plan ready for occupancy about Feb. 1.

Schiewetz said, "Our progress in Clarksville is right on schedule and we anticipate that production in a modest way will be under way by next spring."

The new one-story building will be on a 103-acre site.

THERMO EXPANSION VALVES

For automatic control of liquid refrigerant on all types of refrigeration and air conditioning systems. Capacities: From fractional tonnage to 200 tons. Freon-12 and Freon-22; selective charges. Low temperature valves for -40° F. to -100° F.

TYPE 402 with pressure limiting feature
TYPE TK "3 valves in 1"
TYPE TCL with angle connections
TYPE TCL with straight-thru connections
TYPE TR Multi-Outlet

SOLENOID VALVES

For all types of service. For liquid: Freon-12 up to 75 tons; 110 tons Freon-22. For suction: Freon-12 up to 10 tons; 15 tons Freon-22. For hot gas discharge, brine, water, steam, air or oil service.

TYPE S1
TYPE S2
TYPE M3
TYPE R2

THE ONE COMPLETE LINE OF REFRIGERANT CONTROLS

VENTURI-FLO DISTRIBUTORS

Wide application range. One piece; replace distributors requiring as many as 6 or 7 nozzles.

SUCTION LINE CONTROLS

TYPE 771-772 SUCTION PRESSURE REGULATORS (Hold-Back Valves) Prevent motor overload. Freon-12, Freon-22.

TYPE EPR EVAPORATOR PRESSURE REGULATORS For all refrigerants, with connection sizes up to 6".

TYPE 760 "EVAPOTROL"

Pressure regulator—½ ton, Freon-12—¾ ton, Methyl Chloride.

AMMONIA CONTROLS

TYPE M91F
TYPE TG
TYPE UG
TYPE TX
TYPE E with strainer

Solenoid Liquid Valves—up to 172 tons. Solenoid Suction Valves—up to 28 tons. Thermo Expansion Valves—from fractional tonnage to 125 tons. Automatic Expansion Valves—from fractional tonnage to 60 tons.

FLOAT VALVES AND SWITCHES

TYPE HK high pressure float valve. Up to 5 tons Freon-12, 8 tons Freon-22 and 20 tons Ammonia.

TYPE J56 electric float switch. For Freon, Methyl Chloride, Ammonia and other non-corrosive liquids having a specific gravity of .5 or more. Up to 230 volts AC or DC.

908 LECTRO-LEVEL electronic remote control of liquid level. Accurate control for full-flooded evaporators. Adjustable to a wide range of level changes. Easy-to-set control dials conveniently mounted in remote box.

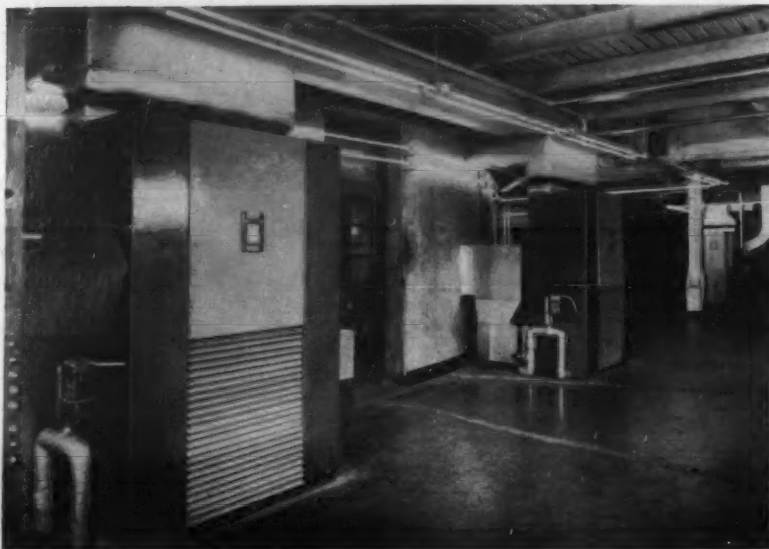
For capacities in excess of those listed, write us and give specific requirements.

SEE YOUR ALCO WHOLESALER

ALCO VALVE CO.
853 KINGSLAND AVE. • ST. LOUIS 5, MO.

ALCO ALSO OFFERS YOU Constant Pressure (Automatic) Expansion Valves—Reversing Valves—Liquid and Suction Line Strainers.

Huge Power Station Conditioned by 150-Ton Zoned Control Packaged Units



FLOOR-MOUNTED General Electric packaged units located outside control rooms 3 and 4 of the Clifty Creek power station of the Indian-Kentucky Electric Corp.



AIR CONDITIONED locker room at Clifty Creek power station. This power station provides power for one customer only—the Atomic Energy Commission's Portsmouth, Ohio diffusion center for the production of U-235, a vital component of atomic defense weapons.

Year-Round Comfort Provided for Atomic Energy Diffusion Center

MADISON, Ind.—The largest power plant ever constructed from private capital was completed here recently. It is flexibly air conditioned with more than 150 tons of packaged equipment.

The new power station, called Clifty Creek, has a capacity of 1,290,000 kw. generated by six 215,000-kw. turbine generators. Operated by the Indiana-Kentucky Electric Corp., it has one customer—the Atomic Energy Commission's Portsmouth, Ohio diffusion center for the production of U-235, which is a vital component of atomic defense weapons.

Because of its vast size and because not all areas are used at the same time, zone control of air conditioning was adopted.

Consequently, General Electric packaged air conditioning units were placed in the control rooms, cafeteria, locker rooms, chemical and engineering laboratories, and other working areas. Heating coils in the units provide year-round comfort.

The units, installed by Ward Refrigeration & Engineering Co. of Louisville, include eight 3-ton packages, four of 7.5 tons, and 10 of 10 tons. All operate at 550 volts, a.c.

Located on the Ohio River about 50 miles downstream from Cincinnati, the power station employs 315 men and consumes 4,210,000 tons of coal each year. Costing \$175 million, it will produce 10.1 billion kwh. per year, it was pointed out.

Washington, D. C. Area

Distributors' Refrigeration Sales Rise In First 8 Mos.

WASHINGTON, D. C.—Air conditioning and commercial refrigeration equipment distributors' sales rose 1% in the first eight months of this year compared with the like period a year ago, according to the monthly wholesale report of the Bureau of the Census.

However, August sales dipped 1% from those of the same 1956 month and plunged 13% below July of this year. Inventories rose 4% over August of last year, but slipped 1% under July, 1957.

Electrical appliance, TV, radio set, and electronic parts distributor sales held level with 1956 in the first eight months of this year, but August sales fell off 2% from July and dropped 10% below August, 1956. Inventories in August were 1% higher than the like month a year ago and 2% above July, 1957.

Plumbing and heating equipment supplies distributors saw sales fall off 3% in the first eight months as opposed to the same 1956 period, while August sales jumped 5% over July but slumped 7% from August of last year.

Inventories as of Aug. 31 held even from those of July and August a year ago.

Air Conditioning, Ordering, Installing, Maintaining — Now Made Easier For You . . .



Yes! SATISFABRICATED! ©

It's our way of telling the world that Governair Products are guaranteed to satisfy the widest range, the most exacting capacities, and the most truly unusual space requirements.

Governair offers a SPECIAL saving of time and trouble with its complete line of Self-Contained Units. They're easier to order, since you specify only one unit in place of picking several components. Easier to install, too, since they are delivered fully tested and ready to operate with simple electrical, water and duct connections.

Best of all, Governair's quality engineering and construction assure you of lower cost maintenance so important to the purchaser.

WRITE OR CALL FOR DETAILED INFORMATION.

GOVERNNAIR CORPORATION
4840 NORTH SEWELL
OKLAHOMA CITY, OKLA.



Urges Use of Expansion Valve To More Closely Load Motor-Compressor Assembly To Peak Efficiency

FORT MONROE, Va.—An increasing interest in using expansion valves on smaller packaged air conditioning units that formerly were almost the exclusive preserve of the capillary tube was noted by two speakers at a recent meeting here of Region III, Air-Conditioning & Refrigeration Wholesalers.

"There is a greater interest now in keeping motor load at average capacity rating rather than designing with reserve to meet peak pull-down loads," W. H. Krack, sales manager of Sporlan Valve Co. told the wholesalers.

"Why buy extra motor capacity when you can use an expansion valve to more closely load the motor-compressor assembly to peak efficiency?" he asked.

'Need More Evaporator Space with Capillary'

"In addition to reserve compressor capacity, you need more evaporator surface when using a capillary tube," he pointed out. "A capillary tube also requires extreme care and cleanliness.

"These factors should be considered as part of first cost when making a choice between a capillary tube and thermostatic expansion valve on air conditioning applications," he said.

John A. Schenk, director of engineering for Alco Valve Co., commented that room air conditioners have used capillary tubes almost exclusively in the last several years.

'Reconsideration on Room Conditioners'

However, compliance with standards and codes, such as the Underwriters' Laboratories and the National Electrical Code, has brought about the reconsideration and/or use of constant-pressure expansion valves as well as thermostatic expansion valves on these units, he said.

The acceptance and usage of the thermostatic expansion valve on packaged air conditioning units, declared Schenk, can be attributed to its many advantages, such as:

Claimed Advantages

1. It permits efficient operation of the evaporator by regulating the refrigerant flow entering the evaporator in direct relation to either an increase or decrease in the evaporator heat load.
2. By regulating the refrigerant flow entering the evaporator in direct relation to the flow of refrigerant gas leaving the evaporator, it prevents return of liquid refrigerant to the compressor.
3. It permits greater freedom in design and choice of evaporators.
4. It can be used on a refrigeration system with limited refrigerant system charge or with refrigerant system charge in excess of the minimum amount required.
5. By using an expansion valve with a notched valve pin and seat or a by-pass orifice to provide pressure equalization between discharge and suction pressures on the "off" cycle, the amperes demand per ton of refrigeration (i.e. the installed kva per ton) can be reduced for packaged air conditioning units.
6. Overload of the compressor motor can be prevented by

using a constant-pressure expansion valve or a thermostatic expansion valve with a thermostatic element, incorporating the pressure limiting feature, to limit the maximum operating suction pressure.

7. By using a constant-pressure expansion valve or a thermostatic expansion valve with a thermostatic element, incorporating the pressure limiting feature, to prevent compressor motor overload and either a notched valve pin and seat or

by-pass orifice to provide pressure equalization between discharge and suction pressures on the "off" cycle, the amperes demand per ton of refrigeration (i.e. the installed kva per ton) can be reduced for packaged air conditioning units.

Capillary tubes are in universal use on units such as domestic refrigerators and freezers, which are generally fractional horsepower units, Schenk stated.

"However, these units operate under reasonably constant load conditions and since they are air-cooled units, which operate inside of buildings, they are not subjected to the wide range of discharge pressures as would be the case with other units using outside air for condenser cooling," he argued.

"Here more emphasis has been placed on the difference in the initial purchase cost between the expansion valve and the capillary tube than on the ability of the unit to perform more efficiently over a wide range of operating conditions with the use of an expansion valve.

"Even though the operating cost of a fractional horsepower unit, using a capillary tube, may be 10 to 20% more it is not considered to be a factor.

"The capillary tube performed reasonably well on simple water-cooled packaged air conditioning units with fairly constant load, where the water was wasted to the sewer and the discharge pressure was controlled by a water-regulating valve.

"The introduction of water-saving devices, such as the cooling tower and evaporative condenser, while being satisfactory to the normal refrigeration cycle, made the acceptable per-

formance of the capillary tube, on these units, open to question because it was not economically feasible to use additional components to control discharge pressure.

"In these cases the thermostatic expansion valve is the best answer to the refrigerant flow control problem.

"Water problems and the lack of water supply has incited the trend to the use of air-cooled condensers on these units. Here again discharge pressures are definitely variable, depending solely on the ambient air temperature, and therefore the performance of a capillary tube on such units leaves much to be desired.

"The remote unit presents additional problems, involving length of refrigerant liquid and suction line and critical refrigerant system charge, that makes the thermostatic expansion valve the best answer to the refrigerant flow control problem."

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Designs Shopping Center's Cooling System To Fit 70 Individual Tenant's Needs

Separate Main Bldg. Has Seven Units For Year-Round Air Conditioning

By Robert E. Lacey

DETROIT — Gigantic 2,000-ton duplex centrifugal water chillers with two compressors and motors on one base are focal points of the system which air conditions 70 of the 71 separate stores in this city's newest shopping center—Eastland at Kelly and East 8-Mile Rds.

Members of the local American Society of Refrigerating Engineers chapter climbed up, down, and around the multi-million dollar center buildings recently studying design factors of the first led ASRE members and two Paul Bunyanesque chillers and behemoth heating boilers situated in the central utilities building of the J. L. Hudson Co. shopper's delight.

Joseph Bobbio of Hyde & Bobbio, consulting engineers who planned mechanical features of the suburban Harper Woods center to Detroit's northeast,

2 Design Determinants

"Two design determinants influenced our planning more than others at Eastland," Bobbio explained. "We followed architect

Victor Gruen's Design Philosophy committee's ideas and James T. Mitchell's marshalling of forces of ideas as Hudson's man-in-charge.

There was also a lease agreement in existence which described limits of the landlord's (Hudson's) responsibility for electrical and mechanical work," he continued.

Hyde & Bobbio got together with John Malloy of the contractors' committee, Carrier Corp., maker of the challenging chillers, and George Leeker and Charles Rouse, operating engineers at Hudson's northwest shopping center of Northland, prototype of the new unit. Heads were bumped, Hudson's desires were made clear, and Northland's design problems were solved—or so the engineers think.

Chilled Water Pours At 4,400 F.P.M.

Chilled water volume pours from the duplex chillers in "G" building at 4,400 g.p.m., Bobbio outlined, being pumped at 300-ft. head. Each centrifugal unit has its own condenser and evaporator and chilled water circulates through a two-pipe main-return system, readily accessible for serving. Pipes run from the central heating-cooling plant underneath loading platforms in a truck and service tunnel connecting all seven tenants' structures in the wide-flung center. Space has been left adjacent to the elephantine chillers for another 1,000-ton unit should expansion make more cooling necessary.

Branches to each of the seven tenants' structures go to cool-

ing coils located in penthouses on the roof through globe valves which are metered and can be throttled. A balanced pressure differential volume is maintained in all stores. Cooling towers atop the utility building—"G"—move 12,000 g.p.m. at a more or less constant temperature of from 95.7° to 85.7° F. at 75° wet bulb.

Four packaged water tube boilers which can operate on either gas or oil firing—oil is used nearly all the time—supply heating from the central plant. Each has 120,000-lb. capacity with same-sized unit standing-by if needed.

Can Isolate Any One Bldg. In Breakdown

Bobbio pointed out that any one building can be isolated in case of equipment breakdown, and 5-lb. pressure is maintained at each tenant's store off high-pressure branches. In general there is no fluid heat used, he said, but there are a few store entries onto the truck tunnel where unit heaters are used.

"A" building—five-story Hudson's department store—has seven air conditioning units to condition the structure year-round. There are four interior zones and air is pushed at 100,000 c.f.m.

Booster Ducts Discharge Air

One-temperature dehumidified air is discharged down into the building through booster ducts. The central core mechanical system is situated in the fifth-floor penthouse and has a dewpoint control system.

Run-outs are set in suspended ceilings with flexible connectors to diffusers which permitted adjustment of the acoustical ceilings, Bobbio stated. The perimeter system is essentially the same. Two-temperature air is maintained in the zones with control over interior zones. There are two uncooled systems in "A" building. They maintain temperature and air pressure and relieve pressures to the return system. Air is built-up in entryways and automatically relieved to return systems. Make-up air is pumped into the spray painting booth maintained for posters and altering window and floor promotional items, Bobbio indicated.

Air conditioning systems in penthouses of each tenant's store—which spans nearly the entire length of each—has its own unit and also entry and perimeter-controlled heating from the boiler plant (located in "G" building adjacent to but below the air conditioning water chillers). Units can be set on either "summer" or "winter" at the master control panel situated near the water chillers on

(Concluded on next page)



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Cooling Eastland - -

(Concluded from preceding page) a mezzanine-type floor overlooking the sunken boiler floor of the building.

Tenants have no access to either heating or cooling units except that each has individual thermostats which can be adjusted in each store. "Needless to say," chuckled Bobbio, "this is discouraged."

Perimeter units for heating only are set up for each tenant's store to reduce heat loss in show windows. There is a split-discharge duct in walk-through stores—those having entrances at each end—with separate boosters at each entry. "A curtain of air is laid down which largely prevents heat loss during frequent opening and closing of doors."

Package pickup and special events buildings have packaged direct expansion air conditioning units with condensing systems separate from the central unit, Bobbio detailed.

Winter Cycle Uses 10-15% Fresh Air

Another interesting feature, he pointed out, is that so-called "ventilating air"—a source of controversy among air conditioning engineers—is maintained at a 10-15% fixed minimum of fresh air on the cooling cycle for Eastland. On winter cycle, Bobbio explained, outside air admitted may vary anywhere from 0 to 100%—although design characteristics call for 30-40% almost constantly—with a pressure of .3 to .5 c.f.m. per sq. ft. of room area.

Queried as to how he—and his associates—arrived at such a design condition, Bobbio replied that he didn't think he "had oversupplied outside air." He used American Society of Heating & Air Conditioning Engineers' standard and strictly adhered to national and agreeing local codes (where established) to figure heat loads.

How Heat Load Was Figured

Each store was figured, however, on an arbitrary rate of human occupancy and hourly electrical wattage for heat load. An arbitrary percentage was established, because most of the time stores wouldn't be crowded, and heat loss was "based on that," Bobbio declared. "However, design functions can be adjusted to fit the situation."

Eastland was proclaimed by visiting ASRE members as a "truly fabulous" place with multiple problems to overcome in air conditioning design.

Calif. U

Controlled Conditioned Air Deemed Pre-Requisite In Life Sciences Bldg.

RIVERSIDE, Calif. — Refrigerated cooling of laboratories was considered pre-requisite by planner-administrator and professor groups concerned with planning the new Life Sciences building at the University of California Riverside campus here.

Recent loss of thousands of dollars worth of bacteriological, zoological, and botanical cultures and experiments in other of the campus' laboratories, due to lack of controlled conditioned

air, dictated this need, a report from air conditioning manufacturer Drayer-Hanson indicates.

Thus the \$1,800,000, Pereira & Luckman designed and engineered two-story structure, now under construction, calls for commercial refrigeration units. Individual unit installation is to be made in laboratories which will be devoted to bacteriological, biological, botanical, and zoological instruction and research.

Selected are six units and two

types of Drayer-Hanson low temperature, ceiling-suspended units—the "Spasaver" and HRC lines.

Because of the necessity to perform certain experiments, the maintenance of constant temperatures in these rooms will be held to temperatures ranging from 34° F. to 70° F., depending upon the specific activity, it was explained.

Typical will be the vivarium where toads, insects, etc., are to be kept in fairly low temperatures (around 60° F.). Other of the cold rooms to be used for storage of biological cultures, plants, etc., will be maintained at 40° F.

Faculty offices and other public space areas will be fully air

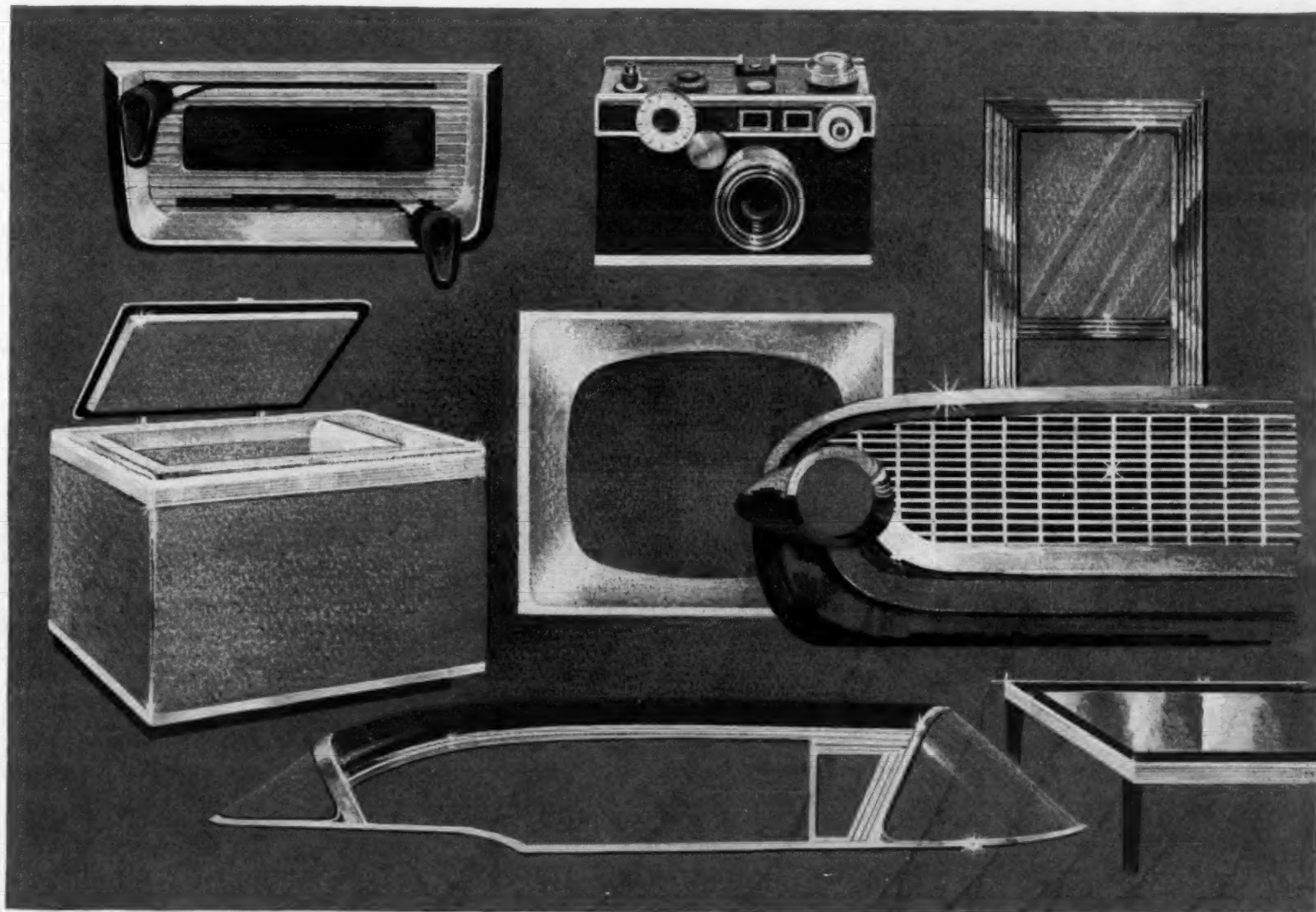
conditioned by double duct systems, it was indicated.

Of interest is the fact that a planted area in the main foyer outside the lecture hall will display samples of experimental work in species of rare plants—which need temperature control.

Recold Opens Ga., N. J. Warehouses

LOS ANGELES—In conjunction with its Silver Anniversary expansion program, Recold Corp. here is opening warehouses in Georgia and New Jersey.

The Georgia warehouse will be located in Atlanta and a specific location for the New Jersey warehouse was in the process of being selected.



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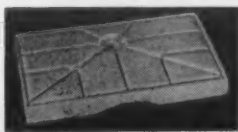
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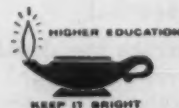
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The Economics of Air Conditioning

What It Costs to Own and Operate Year-Round Systems and Efficiency Increases Needed for Users To Recapture Costs

By John E. Haines, Vice President,
Minneapolis-Honeywell Regulator Co.

From its beginning, air conditioning has contributed to the success of many commercial enterprises. At the turn of the century, for example, air conditioning solved a major problem for the publishing and textile industries by controlling humidity during processing.

Only during the past few years have limited studies been conducted to prove that air conditioning is essential in office spaces, hospitals, schools, and manufacturing plants in order to improve the efficiency, productivity, and health of workers.

Little attention has been given to the economic values of air conditioning because its most obvious impact has been on comfort.

'Growing With Tremendous Strides'

Air conditioning is growing with tremendous strides, and it seems so commonplace today that we would suspect that most of the buildings being built are air conditioned.

We were startled at the results of a recent survey to find that less than one third of the non-residential buildings constructed or remodeled in 1956 had any form of cooling.

And we were even more surprised to discover that after 50 years of improvements in the science of air conditioning, less than 10% of these buildings were equipped with complete year-round air conditioning.

We started a search to determine why so few are buying any kind of air conditioning and why two thirds of those who buy are sold less than adequate air conditioning. This search pointed at these reasons.

Definition of Air Conditioning

They don't understand what air conditioning is.

They don't know the economic benefits.

In order to help clear up these two points, we, with others in the conditioning industry, prepared an analysis and a presentation to overcome these two obstacles.

First, we felt a need to illustrate and clearly explain the difference between complete and incomplete air conditioning. To do this, we have used the definition published by the American Society of Heating & Air Conditioning Engineers.

"Air conditioning is the process of treating air so as to control simultaneously its temperature, humidity, cleanliness, and distribution to meet the requirements of the conditioned space."

Develop Symbol

To illustrate the definition, a symbol was developed. This symbol represents the four major factors included in the definition—temperature, humidity, cleanliness, and distribution.

Let's examine these four factors individually as they relate to a complete and incomplete system of air conditioning.

The first element is temperature—controlled to meet the requirements of the conditioned space. An incomplete system fails to provide for the control of temperatures to meet the requirements of each individual space.

What A Complete System Does

A complete system controls heating and cooling to meet the needs of each space.

The next element is humidity—controlled to meet the requirements of the conditioned space, which means the provision for adequate humidification and de-

humidification to meet the moisture requirements of the conditioned space.

An incomplete system fails to remove sufficient moisture in summer, while a complete system removes excessive moisture in summer. An incomplete system adds no moisture in winter. A complete system adds adequate moisture in winter.

Air Cleanliness

The third quadrant deals with cleanliness of the air—controlled to meet the needs of the conditioned space, which means the adequate removal of dirt and other air borne particles and odors from the air. The incomplete system may remove only 15% of fine particles. A com-

The "Economics of Air Conditioning" means simply how much additional it is going to cost the owner of some kind of a building—from an industrial plant down through an office headquarters to a single residence—to own and operate an air conditioning system.

This material was presented by Mr. Haines, who is a past president of the ASHAE, before the Conference on Designing the Indoor Climate, held at the University of California at Los Angeles earlier this Fall. While parts of it had been presented before, this presentation covers the economics of air conditioning for just about every major type of construction.

It should be of great assistance to those who are asked "what is air conditioning going to cost?"

plete system removes at least 90% of the fine particles which cause most of the staining.

An incomplete system leaves odors in the space and transmits odors from space to space. A complete system removes odors and does not transmit odors from space to space.

The final factor is distribution—designed to meet the requirements of the conditioned space,

which means the introduction and distribution of conditioned air to each individual space without drafts and at an acceptable noise level.

An incomplete system distributes air by groups of spaces. A complete system distributes air to each space individually.

An incomplete system provides for an air volume in one

(Continued on next page)

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Air Conditioning Economics--

(Continued from preceding page) space which is affected by needs of other spaces.

A complete system assures constant air volumes at all times.

An incomplete system distributes air in an uneven pattern.

A complete system distributes air in an even pattern.

It is very important that all of us keep before us these four areas which make up a complete year-round air conditioning system.

Effect of Environment On Human Beings

The human body is actually a human heat machine, and its reaction is changed by daily input and output of energy, skin temperature, and body temperature.

A man gets progressively fatigued when certain bodily func-

tions like heart rate, blood pressure, and oxygen consumption do not return to their lower level after each work period.

Most people are well aware that they tire more quickly when they work in a warm, humid environment than in a cooler one. This is true, physiologists says, because working in high temperature produces stress than working in a cooler environment does. Therefore, fatigue appears sooner.

If people stay in surroundings with a temperature above 90°, their bodies do not return to their lower physiological levels even when they rest. When people are too tired, they work more slowly and with effort, yet make more mistakes.

In industry, fatigued workers are a safety hazard to themselves and others. They wreck the teamwork so essential to

smooth running production lines.

From the human standpoint, these workers are likely to be unhappy because they are overtired, and eventually, their health, as well as their morale, may be affected. For this reason, more people have changed the question, "What will air conditioning cost?" To: "What will it cost to be without air conditioning?"

There is very little sound scientific data to prove the percentage increase in office and factory workers' efficiency and productivity, or the speed of recovery of hospital patients, or the improvement in the learning of students through the use of air conditioning, but here are a few examples which are more than interesting.

Examples of Cooling Benefits

The Detroit Edison Co. made an efficiency study in their drafting room a few years ago. Without air conditioning, 8,988 work

units required 5,008 man hours. Following the installation of air conditioning, 10,474 work units required only 3,872 man hours, indicating an increase in efficiency of 51%.

The Federal Government conducted a stenographic test in 1946 when stenographers typing triangulation data worked two weeks in a non-air conditioned space and were then transferred to an air conditioned space. Using the same typewriters, their output increased 24%.

C. F. Braun & Co., oil refinery and chemical manufacturer, moved into a new building with air conditioning, and they reported a 35% increase in the efficiency of 575 white collar workers. However, some of this increase may have been due to better lighting and improved space arrangement.

A task group of mechanical engineers from the Federal construction agencies was appointed in 1954 to determine the

necessity of air conditioning in Federal buildings, with the cooperation of the building research advisory board.

In their report which was issued in 1955, they said:

"Almost everyone agrees that air conditioning is worth while, but concrete evidence by which management can justify it does not appear to be available. Aside from the merits of air conditioning, it is rapidly becoming an accepted necessity.

Other Factors To Consider

"Additional work output of employees is not enough. Other factors must also be considered. These include: Health, reduced absenteeism, goodwill, and lower personnel turnover.

"Only quality design and equipment should be considered.

"Central air conditioning will generally cost less than individual room units."

John Hardy & Son, manufacturer of nylon hosiery at Pualski, Tenn., reported a 29% increase in production after installing air conditioning. The knitting machines required less maintenance and maintenance costs dropped 80%.

A survey of 75 manufacturing plants in the New York City area indicated that 100 days in each year are so hot or humid that employees either slow down or stop work entirely during part or all of the day, and that the employers lose an average of \$108 each year for each employee working in a non-air conditioned building. Plant absenteeism dropped 25% to 30% after the installation of air conditioning, turnover in personnel was reduced, cleaning costs were lower, and productivity increased.

The Aluminum Co. of Canada reported a sharp drop in absenteeism and rate of turnover among employees after air conditioned rooms were used where the employees could rest at regular intervals.

The Elgin National Watch Co. reported that their re-work decreased 25% after they added air conditioning, and that employee efficiency increased.

Scientific Data 'Due Soon'

It is probable that in the near future scientific data will be available which will permit architects and engineers to predict in advance the increased efficiency and productivity of workers, the improved recovery of hospital patients, and the improvement in the learning of students through the use of air conditioning.

Dr. Brouha, of the du Pont company's Haskell Laboratory, has been studying the effects of high working temperatures on men for more than 10 years and has published reports on the resulting increases in heart rate, blood pressure, and oxygen consumption.

Dr. Brouha's studies, and those of the University of Illinois scientists sponsored by ASHAE, have proved that there is no ill effect when a normal person goes back and forth between cool areas and much warmer ones.

Dr. Harmon, of Austin, Texas, has published data which tends to prove that students learn more quickly in a properly controlled environment and this work is continuing.

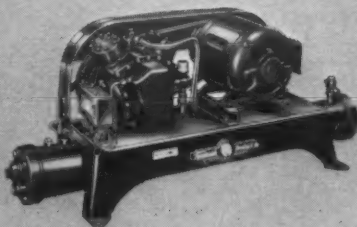
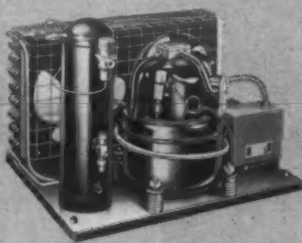
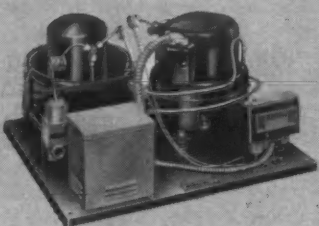
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Study May Prove 'Conclusively' That Conditioning Pays for Itself

(Continued from preceding page)

Nathaniel Glickman has prepared a very complete program at the ASHAE Laboratory in Cleveland which should result in the scientific data which we need to prove conclusively that air conditioning pays for itself in offices, factories, hospitals, and schools. This program has now been started, and we will begin to receive reports within a few months.

In the very near future, controlled environment will become as important from the standpoint of health and efficiency as it already is from the standpoint of comfort. It seems probable that the ASHAE "Comfort Chart" which is so widely used today will become the "Comfort, health, and efficiency chart" at

some time in the near future.

'Helps Patient Recover Quickly'

Today, doctors know that the individual control of the hospital room environment will help a patient recover more quickly. Some patients need warm and humid rooms while others need cool and dry rooms, depending upon the illness.

Considerable progress has been made in using air conditioning in treating allergic disorders such as hay fever and pollen asthma, as well as other diseases, and for heat and cold therapy.

In treating patients with rheumatic arthritis, a hot, dry environment of 90° and 35% relative humidity has proved to be

desirable. Nurseries should be maintained at about 85° and 60% relative humidity.

The Health Department in New York City reported that during the hot spell in the summer of 1955, from July 3 to July 9, the death rate in the city was 40% above that of the corresponding but much cooler week in 1954. The average temperature in 1955 was 82° with highs up to 100°, and it was 71° in 1954 with highs up to 85°.

Efficiency Up

A search of all published literature relating to increased efficiency through air conditioning, however, showed that reports in office buildings resulted in increases in efficiency from 20% to over 50% and in factories from 22% to 28%.

In office buildings, reports relating to reduced absenteeism showed reductions from 27% to 30% and in 75 factories similar

reductions. A report of labor turnover indicated a reduction of 40%. A survey of churches indicated improved attendance of as much as 50%.

A search for opinions of leaders of various industries revealed statements like this by Williams S. Everett, vice president, Browne & Storch, Inc., Chicago.

"If top prices are to be obtained, the top service must be offered. Within the short space of five years, our standards are entirely changed. No office space is grade-A today unless it is air conditioned."

Economics of Air Conditioning

Now, let's get back to the second reason why 90% of the people are not buying complete year-round air conditioning.

The purchaser is faced with the decision to spend a substantial amount of money—the initial cost of an air conditioning sys-

tem. It is difficult for him to weigh this investment unless he is able to relate it to his entire cost of doing business.

When a building owner or designer is deciding whether or not year-round air conditioning should be included, he must consider many factors. Some of these are:

1. The economics from the standpoint of human efficiency increase in performing their daily tasks in the building.

2. The economics of reduced personnel turnover and training due to improved working conditions.

3. The economic ability to compete better for personnel or tenants due to improved environmental conditions.

4. The economics of initial cost and the cost of owning and operating the air conditioning system.

5. The economic value of increased comfort as it affects customers in stores, restaurants, and theaters, or apartment dwellers and hotel guests.

6. The economics of reduced cleaning costs and preservation of interiors and merchandise.

Other Considerations

In addition to these factors, there are many other considerations, both tangible and intangible. However, the hard-headed building investor is often unwilling to accept some of the efficiency increases reported. If he can be shown what efficiency increase is necessary in his particular case for the installation to be economically profitable, then he can make his own decision based on this gain plus all the other factors such as reduced personnel turnover, increased shopper comfort, et cetera.

This presentation attempts to put the cost of year-round air conditioning in its proper perspective relative to the total cost of doing business as this material was developed, we were surprised to note how little an increase in human efficiency is required to make year-round conditioning a sound, profitable investment.

Cost of Conditioning

In the following analysis, the cost of a new building is based upon today's construction costs. The cost of an existing building is based upon one half of today's construction costs.

The annual cost of the insurance and taxes for commercial buildings are estimated at 2% of the original construction costs, except that for public buildings such as hospitals and Federal buildings no tax cost is included and the insurance is estimated at 1%.

The air conditioning cost is based upon a year-round central fan system with a 20-year life, with 5% of the original cost added annually for interest and 2% for insurance and taxes. Again, only 1% is added for public buildings.

Do Not Include Heating Costs

The air conditioning costs do not include the heating costs nor the cost of the heating equipment because an attempt is made to compare the additional cost of year-round air conditioning beyond the cost of a conventional heating system.

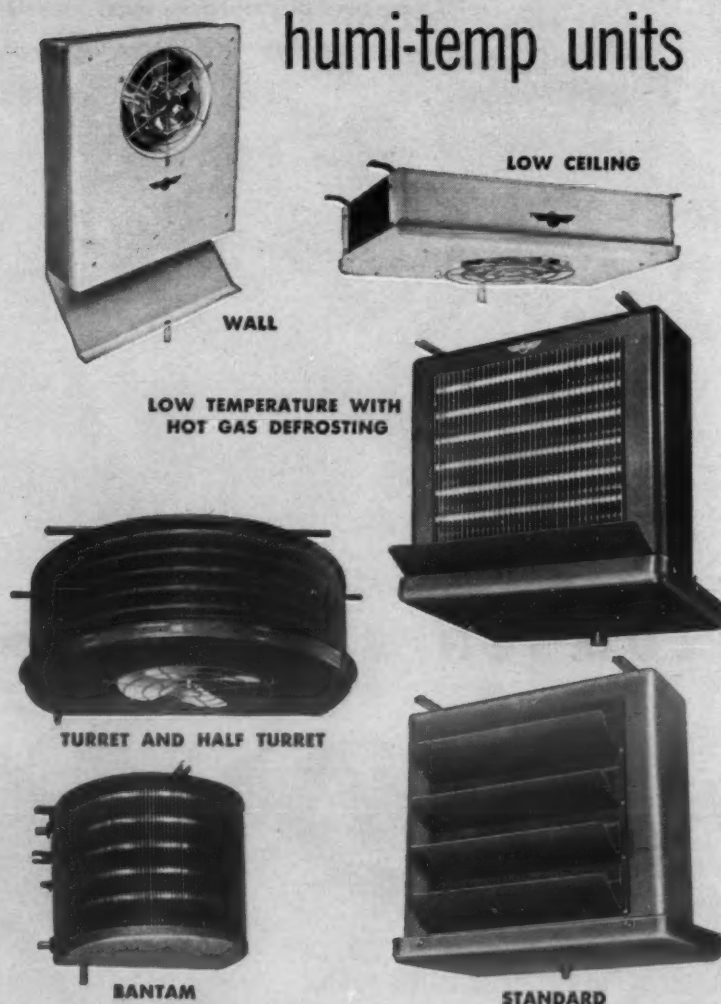
These costs are also based
(Continued on next page)

(BOOTH 405 AT ARI SHOW)

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EXISTING INDUSTRIAL BUILDING

Typical Owning and Operating Costs per sq. ft. per year.



1.5% increased working efficiency is required to pay for complete year-round air conditioning.

NEW INDUSTRIAL BUILDINGS

Typical Owning and Operating Costs per sq. ft. per year.



1.3% increased working efficiency is required to pay for complete year-round air conditioning.

Cooling Costs--

(Continued from preceding page) only upon outside wall areas. If there are interior areas, then the cost of air conditioning would be less than the estimates shown.

These are average costs based upon recent experience in all parts of the country, and these estimates will vary somewhat with the design and geographical locations of the buildings.

New Industrial Building

In a typical new industrial building, the cost of owning and operating the building, including heating, is \$1.92 per sq. ft. per year. Machinery and equipment, including depreciation, obsolescence, maintenance, and taxes, amounts to \$7.05 per sq. ft. per year.

The largest single cost in this factory is that of wages and fringe benefits which is \$36.10 per sq. ft. per year.

The additional cost of owning and operating a complete year-round air conditioning system which is operating 10 hours per day would cost only 46 cents per sq. ft. per year or 1% of the total cost.

This means that if the efficiency of the workers in the

industrial building is increased only 1.3%, the system will pay for itself.

If a less than complete air conditioning system is installed at a first cost saving of 20%, the cost to own and operate the system will be 40 cents or .9% of the total cost. In other words, a complete system only increases the total owning and operating costs by .1%.

Existing Industrial Buildings

In a typical existing industrial building, the cost of owning and operating the building has dropped from \$1.92 to \$1.33 because it is assumed to have been built 20 years ago and its construction cost was about one half of today's building.

The cost of owning and operating air conditioning has risen from 46 cents to 55 cents because it costs more initially to install air conditioning in an existing structure. The initial cost is up from \$3.13 to \$4.00

per square foot. But even here, the investment is a sound one because efficiency increase needed is only 1.5%.

If a less than complete system is installed at a first cost saving of 20%, the owning and operating cost per sq. ft. will be 47 cents, which is 1% of the total cost. Here again, an increase of only .2% in the total cost would provide for a complete and flexible system.

The owner of an industrial building may want to start his air conditioning investment in those departments where the least return is required to pay for the system.

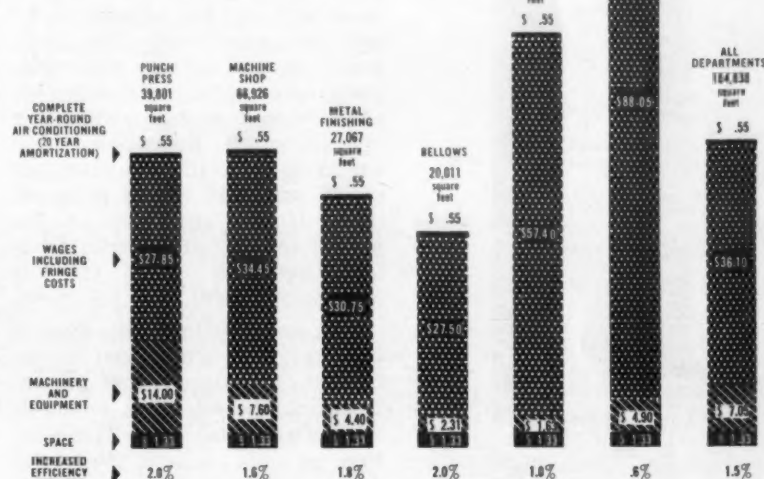
Note the illustration showing typical costs of factory production operations in various departments in a typical plant. In the punch press department, for example, the efficiency increase required is 2%, while in the die repair department it is only .6 of 1%.

(Continued on next page)

TYPICAL COSTS OF FACTORY PRODUCTION OPERATIONS

In an Existing Industrial Building (Per Sq. Ft. Per Year)

Less than 2% increased working efficiency is required to pay for complete year-round air conditioning.

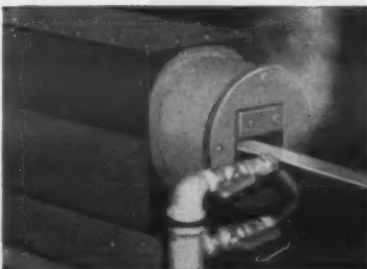


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HOW TO GET EXTRA PERFORMANCE FROM YOUR TUBING DOLLARS!

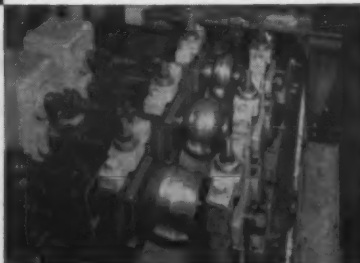


Pressure-testing tubing is part of the strict quality-control standards maintained only by GM Steel Tubing. Solvent is introduced under pressure to all GM Steel Tubing, checking structural strength and assuring an I.D. free of internal residue. Result: the cleanest tubing you can buy. This extra quality is yours at no extra cost.



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GM Steel Tubing is many times cleaner than specifications!

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CHECK FABRICATION FACILITIES. GM Steel Tubing has unequalled fabrication facilities to deliver tubing in any length, in any form to your exact specifications, right on schedule.

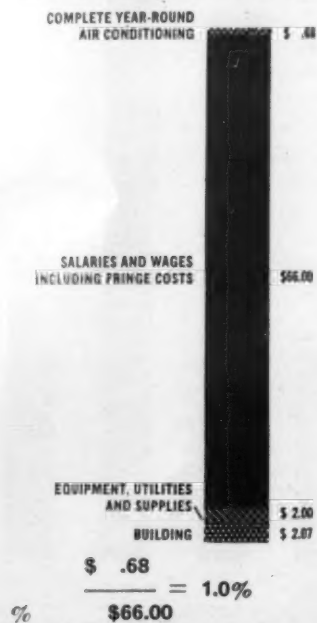
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GM STEEL TUBING by



EXISTING OFFICE BUILDINGS OWNER OCCUPIED

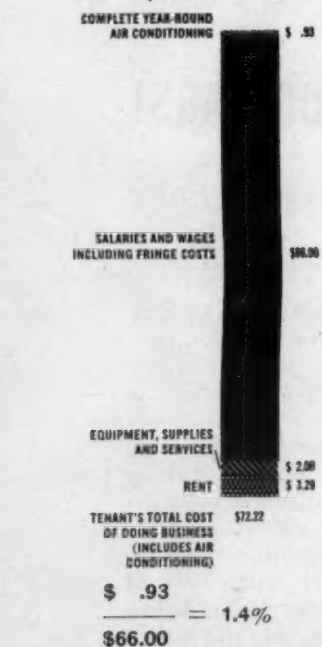
Typical Owning and Operating
Costs Per Sq. Ft. Per Year



1.0% increased working efficiency is required to pay for complete year-round air conditioning.

EXISTING OFFICE BUILDINGS TENANT-OCCUPIED

Conventional Construction—Costs
Per Sq. Ft. Per Year



1.4% increased working efficiency is required to pay for complete year-round air conditioning.

NEW OFFICE BUILDINGS OWNER OCCUPIED

Typical Owning and Operating
Costs Per Sq. Ft. Per Year



.85% increased working efficiency is required to pay for complete year-round air conditioning.

Cooling Costs--

(Continued from preceding page)

New Office Buildings

In a typical office building, the cost to own and operate the building, including heating, is \$2.91 annually per sq. ft. Equipment and supplies amount to \$2 and the payroll \$66. The additional cost of owning and operating a complete and flexible air conditioning system which is operating 10 hours per day would be 56 cents annually per sq. ft., which is .8% of the total cost. If the efficiency of the people in the office building is increased only .85%, the air conditioning will pay for itself.

If a less than complete system is installed at a first cost saving of 20%, the annual cost per sq. ft. would be 48 cents which is .7% of the total cost. The addition of only .1% in the total cost would pay for a complete

and flexible air conditioning system.

Existing Office Buildings

In a typical existing office building, the cost to own and operate the building is \$2.07 annually per sq. ft. Equipment and supplies amount to 4% and the payroll at \$66 per sq. ft. The additional cost of owning and operating a complete air conditioning system would be 68 cents annually per sq. ft., which is 1% of the total cost.

In this case, an increase of efficiency of the people in the office of only 1% would pay for the additional cost of complete air conditioning.

If a less than complete system is installed at a saving of 20% in the first cost, the annual owning and operating cost would be 57 cents per sq. ft., or .8% of the total cost. An increase of only .2% in the total cost would provide for a complete and flexible air conditioning system.

The additional benefits of air conditioning have not been considered for this or any of the buildings, but it is interesting to note that a Federal survey indicates that cleaning costs are reduced 23% when air conditioning is installed. In an average office building, this would represent an additional saving of 13 cents per sq. ft. per year in operating costs.

Now let's examine an existing tenant occupied office building. The building cost at \$3.29 per sq. ft. per year is shown as rent, and is the cost to the owner plus his profit. The costs of equipment and wages remain the same as in the owner occupied building at \$66.

The air conditioning cost of 93 cents is marked up 20% for the owner's profit and is the rental price to the tenant. Even here, the tenant need only realize an increase in efficiency of 1.4%. The largest single increase in air conditioning during

the past few years was in existing office buildings.

It has become fairly well established that when 18% to 20% of the better class of office space has been air conditioned, then all remaining buildings in the same city must sooner or later air condition in order to maintain their status and compete with the more desirable space.

New School Buildings

Educators know that students learn more quickly in environments which are properly controlled. This is particularly true of children who may learn to read twice as fast in classrooms at 70° than at 80°.

Many schools are being built all over the country. Every effort is being made to reduce the cost of these schools, even to the extent of eliminating those things which are teaching aids. Yet, it is not generally

(Continued on next page)

NOW GENERAL ELECTRIC AIR CONDITIONING AS

Lightest 30-ton unit in the business—

by as much as 2000 lbs.—

and completely self-contained

This new General Electric Unit is not another "octopus"—no outside fan motors, filters, controls or other protruding parts. It's as clean-cut as a 3-ton job. Air discharge can be ducted from front, back or top. And it's up to 2000 lbs. *lighter* than other 30-ton units.

General Electric also announces new 20 and 25 ton "packages". These 3 new models, added to the existing units, give you a line to meet *every* requirement for commercial and industrial air conditioning.

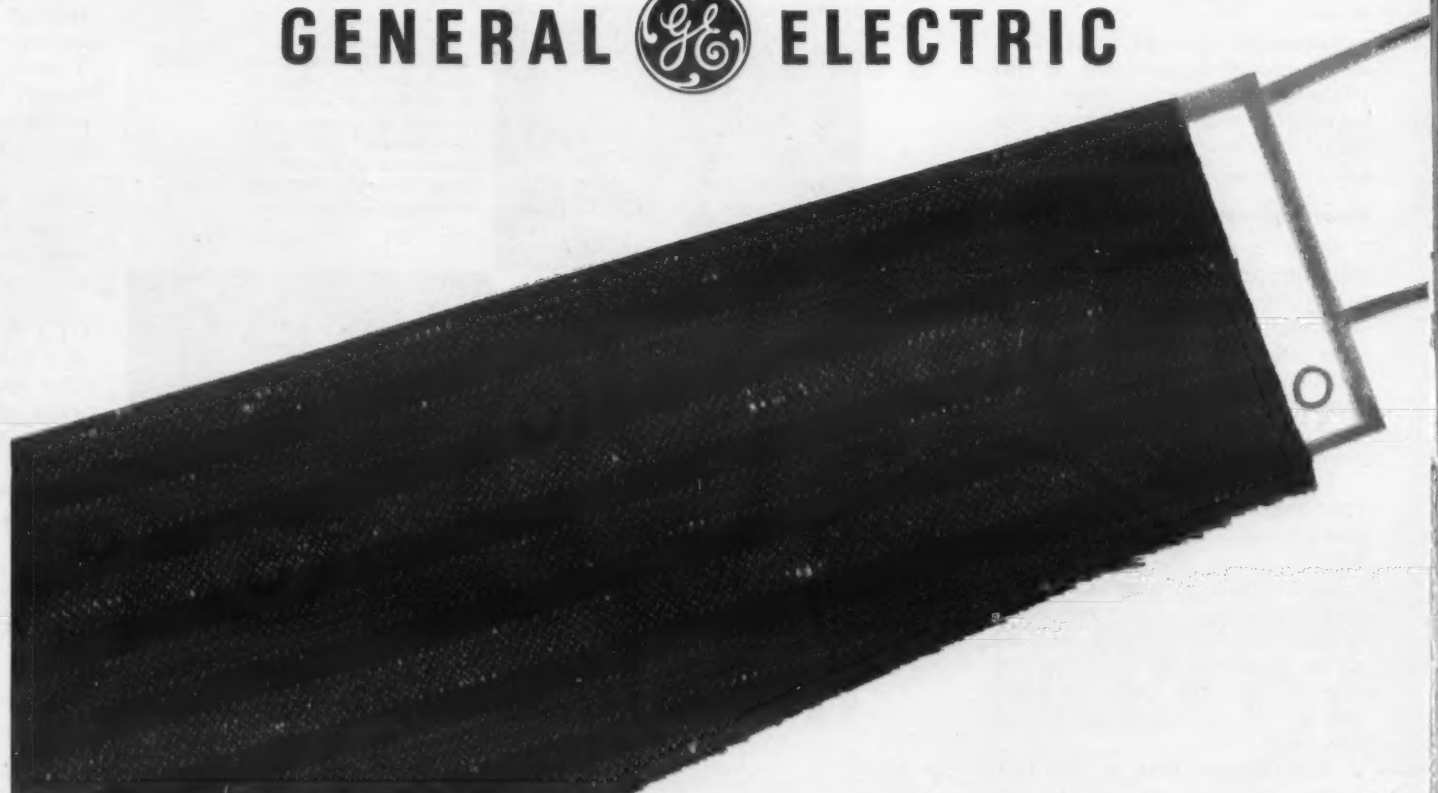
And what a line! Floor-mounted units in 3, 5, 7½, 10,

15, 20, 25 and 30 ton capacities! New air-cooled split systems in 3, 4, 5, 7½ and 10 ton capacities! And self-contained ceiling-mounted units—air-cooled in 3 and 5 ton capacities—water-cooled in 3, 5 and 7½ ton capacities! And there's more to come in 1958!

Get on the bandwagon! Sell General Electric Zone-by-Zone Air Conditioning for more profit in 1958! General Electric will presell prospects for you with powerful advertising, sales promotion and direct mail. See your distributor or mail coupon for complete details.

Progress Is Our Most Important Product

GENERAL  ELECTRIC



Owning, Operating Expenses --

(Continued from preceding page)

known that only 10% of the expense of operating a school system is spent on the construction and maintenance of the school building. A reduction in the cost of the building and its facilities may very well increase the subsequent cost of the school system and reduce the value of the possibilities for learning.

There will be more air conditioning in schools as parents and the public appreciate the importance of air conditioning as a teaching aid and as they learn that air conditioning will add very little expense to the over-all cost of education. Also, the trend is toward the year-round use of schools, either as classrooms or for other community purposes.

Some public schools are being air conditioned today. G. B.

Wadzeck, superintendent of schools in San Angelo, Texas, built five elementary schools last year. This is a layout of one school without air conditioning which follows the open design characteristic of many of today's schools.

Wadzeck had his architect and engineer design one school to include air conditioning. This is its floor plan, and it takes advantage of compactness and economics which air conditioning makes possible. When the bids were taken, they were analyzed and it was found that the Belaire air conditioned school cost 8% less than the non-air conditioned school.

The additional cost of owning and operating a complete and flexible classroom air conditioning system, on the basis of a nine-month season in the north temperate zone, is 26 cents an-

nually per sq. ft. or 2.8% of the total cost. This is 4.0% of the payroll which means that if the teaching efficiency is increased only 4.0%, the air conditioning will pay for itself.

Educators estimate that the learning of the average student will increase from 15% to 60% in a proper thermal environment. From a cold economic standpoint, considering the yearly cost of a student in school, and that the purpose of the building is to educate the student, an increase of about 2.3% in learning is all that is needed to justify air conditioning.

New Store Buildings

In a typical new store building, the cost of owning and operating the building is \$2.25 annually per sq. ft. or 13.5% of the total cost. Equipment and supplies cost \$4 per sq. ft. or 24.0% and labor is \$10 or 60.0% of the total cost.

The additional cost of owning

and operating a complete year-round air conditioning system is 41 cents annually per sq. ft. or 2.5% of the total cost. If the efficiency of the personnel is increased only 4.1%, air conditioning will pay for itself.

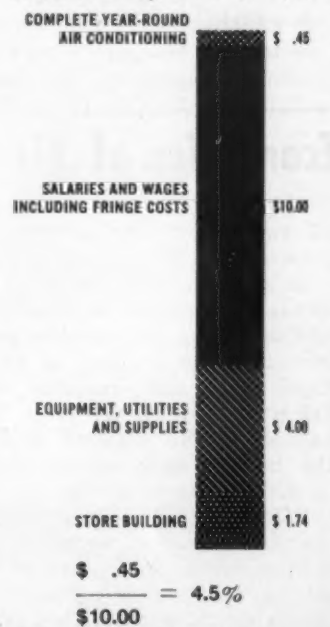
If a less than complete system is installed at a first cost saving of 20%, the annual cost per square foot would be 36 cents which is 2.2% of the total cost. The addition of only .3% in total cost pays for the benefits of a complete and flexible air conditioning system rather than an incomplete one.

Existing Store Buildings

In a typical existing store building, the annual owning and operating cost is \$1.74, equipment and services \$4, and labor costs \$10 per sq. ft. The additional cost of complete air conditioning is 45 cents or 2.8% of the total cost and, in this case, a 4.5% increase in efficiency will pay for the air conditioning.

EXISTING DEPARTMENT STORES

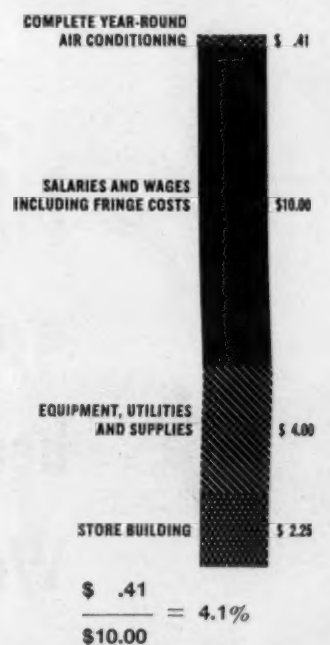
Typical Owning and Operating Costs Per Sq. Ft. Per Year



4.5% increased working and selling efficiency will pay for complete year-round air conditioning.

NEW DEPARTMENT STORES

Typical Owning and Operating Costs Per Sq. Ft. Per Year



4.1% increased working and selling efficiency will pay for complete year-round air conditioning.

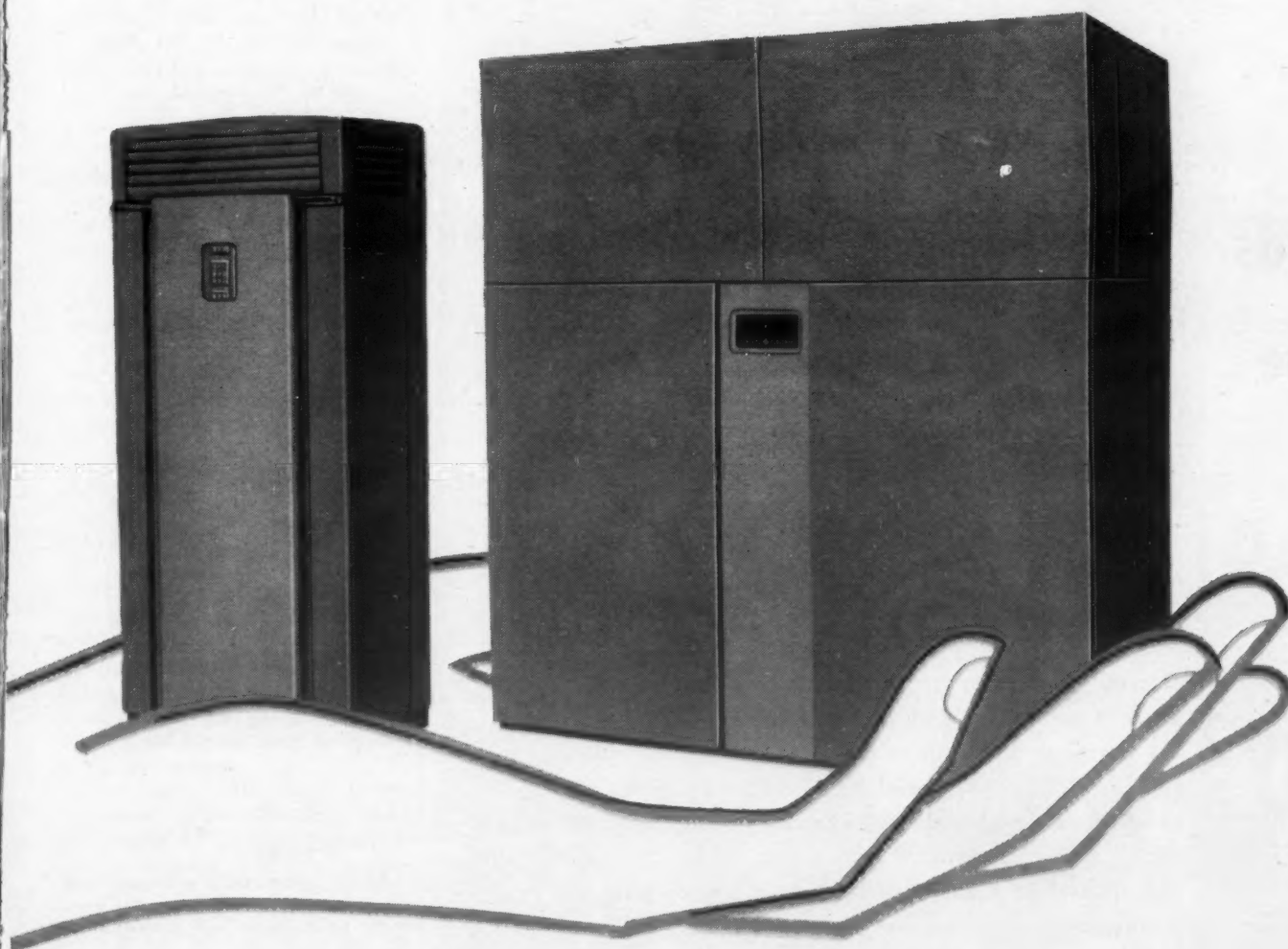
If a less than complete system is installed at a first cost saving of 20%, the annual cost per square foot would be 39 cents or 2.4% of the total cost. The addition of only .4% in total cost pays for a complete and flexible air conditioning system.

The personnel efficiency increase ignores any increased purchases by shoppers due to a more comfortable feeling. Average sales in a store are \$78 per sq. ft. per year, and an increase of 2% in sales would also pay for the air conditioning.

Hospitals, too, presented an interesting case because the number of people to serve 100 patients has increased 30% in

(Continued on next page)

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be there.

The second and concluding instalment of "The Economics of Air Conditioning" will offer some figures on the costs of owning and operating air conditioning in those enclosures in which people live—such as hotels and motels, apartment buildings, and single residences. It will be published in a following issue of the NEWS.

Economics of Air Conditioning--

(Continued from preceding page)

10 years, and the payroll has grown to be 64% of all costs. In a typical new hospital, the annual cost per sq. ft. of owning and operating the patients area, including the heating, is \$5.56. Equipment and supplies cost \$19.80 per sq. ft. per year. The payroll in the patients area is the largest expense amounting to \$26.94 yearly per sq. ft.

The additional cost of owning and operating a complete and flexible air conditioning system in the patients area, which is operating 24 hours a day, seven days a week, is 76 cents per sq.

ft. per year, or only 1.4% of the total cost. This is 2.8% of the payroll, which means that if the efficiency of those people on the payroll in the patients area is increased 2.8%, air conditioning will pay for itself. There are, of course, other benefits such as the probable more rapid recovery of patients, lower cleaning costs, et cetera.

If a less than complete air conditioning system is installed in the patients area, and it is assumed that the first cost is reduced by 20%, the cost of owning and operating the patients area, the cost of equip-

ment and supplies, and the payroll remains the same.

However, the cost of owning and operating an air conditioning system in the patients area is reduced by only 7 cents to 69 cents per sq. ft. per year, and this amounts to 1.3% of the total cost instead of 1.4%. In other words, the total cost would only be increased .1% to install a complete and flexible air conditioning system.

Existing Hospitals

In a typical existing hospital, the cost of owning and operating the patients area would be \$4.76, equipment and supplies \$19.80, and the payroll remains at \$26.94 per sq. ft. per year. The additional cost of owning and operating a complete air conditioning system in the patients area would be 83 cents per sq. ft. per year, or 1.6% of the total cost. The increased efficiency required of those on the payroll in the patients

area for air conditioning to pay for itself would be 3.1%.

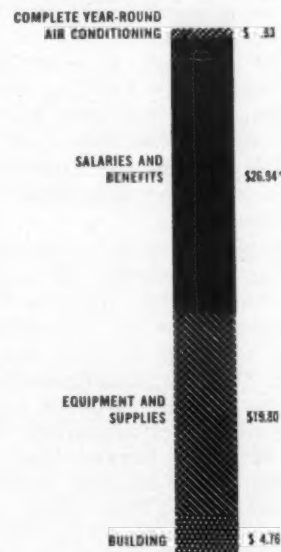
If a less than complete air conditioning system is installed at a first cost saving of 20%, the cost of owning and operating would be reduced to 75 cents per sq. ft. or 1.4% of the total cost. Here again, the complete and flexible system only increases the total cost by .2%.

Hospital Management magazine has charted the average summer slump in occupancy which starts in March and runs through September. An analysis of the slump in occupancy in a typical hospital shows that a hospital need improve its occupancy only 7.3% during these warm months to completely pay for the added cost of complete year-round air conditioning.

Today, more than half of the hospitals in the country have air conditioning in some form in some area. Within a few years, all modern hospitals will be completely air conditioned.

EXISTING HOSPITAL BUILDINGS

Typical Owning and Operating Costs Per Sq. Ft. Per Year* (Based on Hospital Patient Area—200 sq. ft. two-bed room)



Conversion Formula

Costs Per Bedroom Per Day =
Cost Per Sq. Ft. Per Year
x Area In Sq. Ft.

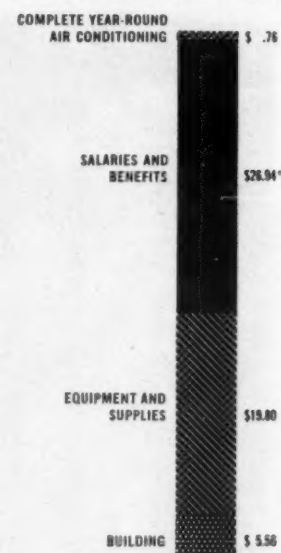
$$\frac{365}{\$.83} = 3.1\%$$

3.1% increased working efficiency is required to pay for complete year-round air conditioning.

*Based on estimate that one-half of Total Hospital payroll is expended in patient bedrooms.

NEW HOSPITAL BUILDINGS

Typical Owning and Operating Costs Per Sq. Ft. Per Year* (Based on Hospital Patient Area—200 sq. ft. two-bed room)



Conversion Formula

Costs Per Bedroom Per Day =
Cost Per Sq. Ft. Per Year
x Area In Sq. Ft.

$$\frac{365}{\$.76} = 2.8\%$$

2.8% increased working efficiency is required to pay for complete year-round air conditioning.

*Based on estimate that one-half of Total Hospital payroll is expended in patient bedrooms.

Reynolds Heads RTA for '58

WASHINGTON, D. C.—Albert Reynolds has been elected president of the Refrigeration Trade Association, Inc. here, heading up a new slate of officers for 1958.

Bernard Menditch is new vice president; Neale Clarke, recording secretary; Charles Beverley, treasurer; H. W. Sadler, corresponding secretary; H. W. Clarke, sergeant-at-arms; Sidney Bloom, Anthony Greco, Ralph Lord, and Charles Angel directors for two years; and E. M. Logan, director for one year.

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Because manufacturers know that Wolverine—from its years of association with the refrigeration industry—has the know-how and facilities to provide exactly the kind of tubular products they need. Products, for example, such as lightwall commercial tube in extra long coils, integrally finned Wolverine Trufin® (for greater BTU extraction) and Wolverine Capilator® (for precision metering of liquids and gases)—to name but a few. You'll be in select company when you specify tubing and tubular-shaped products produced the Tubemanship way by Wolverine Tube. For more information write for "Wolverine Serves the Refrigeration Industry," and be sure to visit our booth No. 551 at the ARI Show in Chicago, November 18-21.

Wolverine Trufin is available in Canada through the Unifin Tube Company, London, Ontario.

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Well Water Provides Bowling Alley Lower Ambient Cooling

Installs Dual-Stage 2 Free-Standing Units

LAWRENCE, L. I., N. Y.—Falcara's Bowling Alley here has recently completed a modernization program which includes the installation of two free-standing air conditioners and a dual-stage central unit. Combined the three units are capable of producing up to 50 tons of refrigeration.

Called "Double-Kool" and manufactured by Hastings Air Control, Inc. of Hastings, Neb., the units cool by circulating well water at lower ambients and by refrigerant coils at higher ambients.

REFRIGERANT COIL CUTS IN IF NEEDED

The Falcara Bowling Alley uses well water available on the premises at 58° F. When first placed under a cooling load, the water coil and blower fan are placed in operation. Should the load require further cooling, the refrigerant coil cuts in.

The central unit feeding a duct system contains a combination 6-row water coil and a 2-row refrigerant coil. It is powered by a 15-hp. Brunner compressor.

5-HP. COMPRESSORS

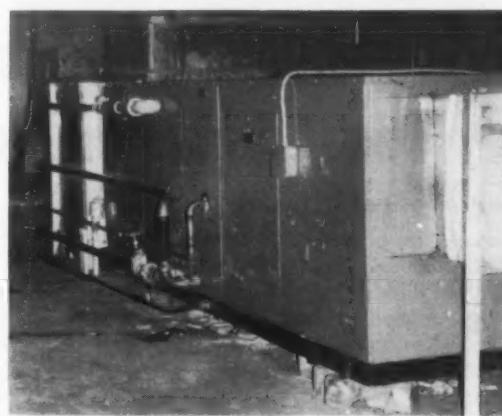
The free standing units operate with a 4-row coil and a 2-row refrigerant coil. Powered by 5-hp. compressors they are capable of developing 7½ to 11 tons of refrigeration each, the manufacturer claims.

One self-contained unit is recessed in the wall next to the checkroom. The other is floor mounted further along the promenade behind the alleys. Both discharge air over the area occupied by bowlers.

The remote system serves the remainder of the alley. All units can be either thermostatically or manually controlled.



INTERIOR view of Falcara's Bowling Alley, showing the two Hastings DK-50 air conditioners directly behind the bowlers. At left can be seen one of the units recessed into the wall next to the check room where a thermostatic control serves the remaining portion of the alley through a remote system.



MODEL DKR-800 15-hp. "Double-Kool" which can develop up to 40 tons of air conditioning using a six-row water coil and a two-row "Freon" coil. The water coil uses well water found on the premises.

A Complete LINE OF REFRIGERATION PRODUCTS WITH Complete ENGINEERING "KNOW-HOW"

BY *McQuay*



TWO WAY UNIT COOLERS—5 sizes
800 to 5000 BTU/Hr.

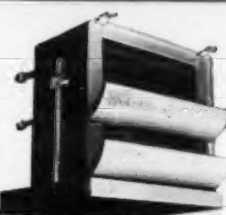


RADIAL UNIT COOLERS—8 sizes
2000 to 21,000 BTU/Hr.



PACEMAKER UNIT COOLERS
10 sizes—4500 to 88,000 BTU/Hr.

High Temperature Unit Coolers



HOT GAS DEFROST UNIT COOLERS
8 sizes—3000 to 45,000 BTU/Hr.




LOW TEMPERATURE PRODUCT FREEZERS 6 sizes—12,000 to 90,000 BTU/Hr.



SPEED TUNNEL FREEZERS
—8 Models—
10,500 to 30,000 BTU/Hr.

Low Temperature Product Coolers and Freezers

SEE *McQuay*
at the Air Conditioning
and Refrigeration
Industry Exposition
Chicago International
Amphitheatre
Nov. 18-21
Booths 501-502-503



Atlanta To Condition 14-Story City Hall

ATLANTA—The Atlanta city government has been assured of cooler quarters for next summer.

The board of aldermen has approved a \$593,915 bid to air condition the 14-story City Hall. The bid was submitted by Sasser & Co. of Atlanta.

According to Building Superintendent Howard Monroe, work will begin in the near future on air conditioning the lower stories of the building. However, he said that the work on the upper portion of the building must be connected with the heating facilities, necessitating waiting until spring when the heating units are cut off.

Officials said the air conditioning is to be financed under capital improvement bonds approved last March.

Trying to find
the right man for a
hard-to-fill vacancy—
the NEWS' Classified
Ads are read by your
man.

Place your ad today!

Condensers

When you sell McQuay refrigeration products, you sell a line that is complete, and a line that brings you year 'round profit. You also sell a line that is completely engineered and backed by the know-how that has made McQuay famous. McQuay has the abilities and also the facilities to make the very finest equipment. McQuay, Inc., 1607 Broadway St. N.E., Minneapolis 13, Minnesota.



EVAPORATIVE CONDENSERS
Centrifugal Fan Type
3 sizes—3-1/2, 6 and 12 tons



REMOTE AIR COOLED CONDENSERS—Centrifugal Fan Type
4 sizes—2, 3, 5 and 7-1/2 tons



REMOTE AIR COOLED CONDENSERS—Propeller Fan Type
11 sizes—2 to 50 tons



HORIZONTAL EVAPORATORS
4 sizes—2, 3, 5 and 7-1/2 tons.
27,500 to 92,100 BTU/Hr.; 800 to 3000 CFM



CEILING MOUNTED AIR CONDITIONERS—Unlimited number of sizes and types. 200 to 3000 CFM. 8250 to 127,400 BTU/Hr.



VERTICAL EVAPORATORS
4 sizes—2, 3, 5 and 7-1/2 tons.
27,200 to 90,000 BTU/Hr.; 800 to 2000 CFM



FLOOR MOUNTED SEASONMAKERS
4 models from 200 to 600 CFM. 6250 to 21,800 BTU/Hr.

McQuay
Means Quality

AIR CONDITIONING • HEATING • REFRIGERATION



McQuay INC.

Wichita Residential Installations Up 12% In '57; See Consumer Acceptance Growing

(Continued from Page 1)

Wichita market as possible, it would be well to point out that the over-all gain made in 1957 could have been more apparent than real. As was explained in the NEWS analysis of 1956 sales (published in the Jan. 14, 1957 issue), there may have been 200-odd more residential installations that year than the 1,165 actually traced.

Definite gains over 1956, however, were reported by several contractors, but some noted fewer sales this year. Although the number of contractors (38) is the same for both 1956 and 1957, the identity of the firms is not the same in all instances for both years. Three of the firms reporting in 1956 are now out of

business. Four others who made some residential installations in 1956 did none in 1957.

One newly organized firm, however, shows up in the 1957 picture, and six other contractors who reported no residential jobs in 1956 have some to their credit in 1957.

Detailed analysis of the 1957 Wichita residential air conditioning installations is given in the accompanying table, which shows the number of jobs in new homes installed either at the choice of the owner or the builder; number in existing homes; a breakdown between year-round systems and cooling only; remote and self-contained air-cooled systems; water-cooled systems; jobs with cooling

towers, and whether or not the contractor operates his own sheet metal shop.

Existing Homes Score Largest Increase

Existing homes accounted for 619 jobs, the tabulation for 1957 shows, while installations in new homes totaled 688. Both categories represent a gain over 1956, but the larger gain was in the existing home market.

Installations in existing homes accounted for 47.3% of the jobs in 1957, compared with 45.7% in 1956 and 42.6% in 1955. New home installations represented 52.7% of the 1957 total, compared with 54.3% in 1956 and 57.4% in 1955.

Most significant figures in the

1957 tabulation, however, are probably found in the breakdown of new home installations showing how many jobs were installed at the choice of the owner or buyer of the home as compared with those installed by the builder before the home was sold.

(In making this tabulation the NEWS assumes that a system installed in a new home within approximately six months after the house has been purchased and occupied should be logically classified as a "new home" rather than "existing home" installation.)

In 1957 new home installations made at the choice of the owner accounted for 408 jobs (59.3%) while installations at the choice of the builder amounted to 280 (40.7%).

This is in sharp contrast to the 1956 picture which found "owner" installations totaling 262 (41.5%) and "builder" jobs running to 370 (58.5%).

Undoubtedly the drop in "builder" installations shown in the 1957 survey reflects the national picture of speculative home building in the past season, which was down somewhat from previous years.

More New Home Owners Seek Air Conditioning

The gain in new home installations at the choice of the owner would certainly seem to indicate growing consumer acceptance of residential air conditioning. This would also seem likely in the 1957 increase of sales to the existing home market.

There may be another contributing factor in the new home market, however. Although it is difficult to obtain any accurate figures on this phase of the subject, several contractors and distributors point out that many of the heating systems being installed in new homes today have provision for the easy addition of a cooling coil, particularly for use in conjunction with a remote condensing unit. Contractor No. 2, for example, who reports 196 cooling installations, also put in 437 straight heating jobs during 1957, all of which are designed so that cooling can be easily added, he says.

Further evidence of this trend may or may not appear in the comparison of year-round installations and cooling only jobs. In the 1957 Wichita survey, the table shows, there were 696 year-round installations and 611 cooling only systems installed. The 1956 survey turned up 694 year-round and 440 cooling only jobs.

Air-Cooled Units Up Despite Favorable Water Supply

As for the type of condensing unit being employed, the 1957 Wichita study very definitely shows the increasing dominance of air-cooled equipment. Of the 1,307 jobs in 1957, a total of 1,106 were air cooled. Thus air-cooled installations represented 84.7%. In 1956 air-cooled residential units accounted for 66.4% of the jobs; in 1955, 48.9% of the installations.

There seems also to be a definite trend to remote or split systems, judging by the 1957 Wichita installations. Of the 1,106 air-cooled jobs, 1,045 employed remote condensing units while 61 were self-contained units. In 1956 the proportion was 554 remote air-cooled units to 132 self-contained systems.

Number of water-cooled jobs was off substantially in 1957 from the previous year. There were 381 water-cooled systems in 1956; 201 in 1957. The number of cooling towers used with residential systems dropped from 118 in 1956 to 27 this year.

It is interesting to note that the growing preponderance of air-cooled residential systems in Wichita comes despite the fact that many sections of the city are blessed with a plentiful supply of ground water at an average depth of 16 ft. Incidentally, this source of water minimizes the sale of cooling towers, for most residential jobs that do employ water-cooled units simply discharge the water over the lawns.

Twenty-six different brands of equipment are represented in (Concluded on next page)



Just like that!

ROUND OAK

Customers Help You Sell!



ROUND OAK HEATING

— with air conditioning so easy to add!

Round Oak has had a guiding principle these 86 years that quality . . . real quality . . . is not a hocus-pocus matter recognized only by experts. Nobody knows better than your customer, for instance, how his heating equipment is satisfying his demands. Our endeavor has been . . . and will continue . . . to make every Round Oak customer a Round Oak Salesman.



Isn't this type of equipment what you'll be proud to offer your customers? Round Oak "home comfort" equipment is backed by an "old-reliable" manufacturer . . . with a "young," aggressive sales and promotion program to fortify your efforts.

ROUND OAK CO., INC. • Dowagiac, Michigan

Gentlemen: Please rush me full details on the Round Oak heating and air conditioning line.

Name _____

Firm _____

Address _____

City _____ State _____



ROUND OAK CO., INC.
DOWAGIAC, MICHIGAN

Residential Air Conditioning Installations In Wichita During 1957

Con- tractor	1956 Units	1957 Units	New Owner	Homes Builder	Exist- ing Homes	Year- Round	Cooling Only	Air Cooled Remote	Cooled S.C.	Water Cooled	With Cooling Tower	Sheet Metal Shop
1	196	199	80	53	66	124	75	168	2	29	6	Yes
2	84	196	146	40	10	186	10	103	....	93	....	Yes
3	50	80	30	20	30	50	30	60	....	20	....	Yes
4	30	75	5	....	70	5	70	64	....	11	4	No
5	44	56	11	15	30	16	40	41	....	15	10	Yes
6	82	54	17	18	19	35	19	49	....	5	5	Yes
7	35	49	....	39	10	44	5	49	....	....	....	Yes
8	74	47	....	47	....	47	....	46	1	....	....	No
9	28	46	14	16	16	30	16	46	....	....	....	No
10	39	45	35	....	10	35	10	45	....	....	....	Yes
11	38	44	4	....	40	11	33	41	....	3	....	Yes
12	20	40	12	....	28	12	28	38	....	2	....	No
13	....	40	2	....	38	10	30	35	....	5	....	No
14	33	29	....	....	29	9	20	29	....	....	....	Yes
15	38	27	5	3	19	9	18	19	3	5	2	No
16	39	25	....	3	22	....	25	....	25	....	....	No
17	19	24	6	6	12	12	12	24	....	....	....	Yes
18	7	24	2	....	22	2	22	20	....	4	....	Yes
19	25	20	2	....	18	2	18	14	6	....	....	No
20	12	20	....	....	20	....	20	20	....	....	....	No
21	6	20	3	....	17	....	20	20	....	....	....	No
22	20	18	3	....	15	3	15	....	11	7	....	Yes
23	....	16	6	2	8	8	8	16	....	....	....	Yes
24	31	15	....	15	....	15	....	5	10	....	....	No
25	9	14	4	3	7	7	7	14	....	....	....	Yes
26	....	14	....	....	14	3	11	14	....	....	....	Yes
27	8	13	....	....	13	....	13	13	....	....	....	No
28	5	12	6	....	6	6	6	10	....	2	....	Yes
29	7	11	6	....	5	6	5	11	....	....	....	No
30	4	10	7	....	3	7	3	8	2	....	....	Yes
31	....	6	....	....	6	....	6	6	....	....	....	Yes
32	1	5	....	....	5	....	5	5	....	....	....	No
33	6	4	....	....	4	....	4	4	....	....	....	Yes
34	9	2	1	....	1	1	1	2	....	....	....	Yes
35	5	2	....	....	2	....	2	2	....	....	....	Yes
36	4	2	1	....	1	1	1	2	....	....	....	Yes
37	1	2	....	....	2	....	2	2	....	....	....	Yes
38	3	1	....	....	1	....	1	....	1	....	....	No
Total	1,134*	1,307	408	280	619	696	611	1,045	61	201	27	

*Includes installations of six firms not active in 1957.

Wichita Residential Air Conditioning--

(Concluded from preceding page) the 1957 survey, compared to 29 noted in the 1956 Wichita study. Of the 26 brands, 15 (the same as in 1956) were produced by manufacturers who are historically air conditioning and/or refrigeration firms, while 11 brands came from "furnace" manufacturers.

The 15 air conditioning manufacturers are represented by a combined total of 724 installations, or an average of 48 apiece. The 11 "furnace" manufacturers grabbed 583 jobs between them for an average of 53 each.

Six of the 26 brands noted in the 1957 survey are credited with more than 100 units each. These are represented with 196,

193, 145, 128, 115, and 114 systems, respectively, for a combined total of 891. Three of these top brands are air conditioning manufacturers with a combined total of 453 jobs; the other three, furnace manufacturers, have a combined total of 438 jobs.

Most Contractors
In Heating and Cooling

Most (25) of the contractors interviewed in the 1957 Wichita survey are in both the air conditioning and heating business concentrating on the residential market and the smaller commercial jobs. These 25 contractors accounted for 1,018 residential

installations in 1957. Four firms apparently limit themselves primarily to air conditioning.

Three mechanical contractors are included in the Wichita picture this year. The latter are seldom any great factor in the residential business because their installations in homes are usually made only for their commercial and industrial customers. This was pretty much the case this year.

Appliance dealers have yet to make much of an impact on the Wichita market, judging by the 1957 study. There were six such dealers with a combined total of 122 jobs between them, according to the survey this year.

Armstrong 'Prizes for Prospects' Campaign
Encourages Customers To Sell Friends

COLUMBUS, Ohio — Armstrong Furnace dealers believe they have a partial answer to the problem of how and where to get more sales, according to Armstrong Furnace Co. here.

The solution is the old referral plan—sometimes called "Use the User"—and it's always been successful, says the manufacturer. Armstrong calls the plan "Prizes for Prospects."

The plan involves use of a brochure bearing on its front cover the message: "There's a Gift In Here for You . . . from Your Armstrong 'Home Climate' Dealer."

Several pages of the brochure, given to new Armstrong product owners, are devoted to pictures and features of 32 gifts. A "User" can get the gift of his choice by recommending the

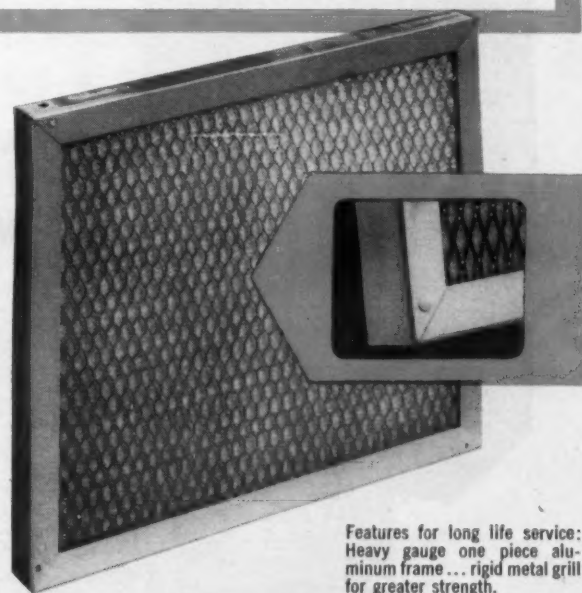
names of one or more possible prospects for an Armstrong furnace or air conditioner, provided a sale results.

Included in the brochure is a letter from W. J. "Ole" Olsen, vice president and general manager of Armstrong, in which he congratulates the new Armstrong product owner on having bought an Armstrong unit.

This, in effect resells the new user, the company says. The list of features also "helps the new user turn salesman," it was pointed out. "He can tell his friends about his new furnace or air conditioner and convince them to buy one."

The final page of the brochure consists of two "built-in" referral cards. The user fills in the cards. If the prospects buy, the user then selects any gift.

**You make more profit
per filter sale with
Skuttle-Aire
permanent filters!**



Features for long life service:
Heavy gauge one piece aluminum frame . . . rigid metal grill for greater strength.

Here are the reasons why
you get more with Skuttle-Aire:

because they're permanent . . . built for lifetime wear.

because they're cleaned in a jiffy when dust and dirt particles gather, simply remove, clean with plain water and replace . . . that's all there is to it.

because they're maintenance-free . . . nothing to wear or replace, never need oiling.

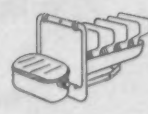
because they're filled with new-type filtering material . . . multiple layers of specially woven plastic filaments with permanent electrostatic qualities, making it the ideal dust and dirt collecting agent.

SKUTTLE-AIRE permanent filters are available in all sizes for furnaces, central air conditioning systems and room coolers.

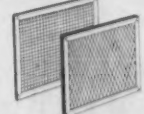
Write today for complete information on Skuttle's quality products that give you more profitable sales.

Skuttle MANUFACTURING CO.
MILFORD, MICHIGAN

IN CANADA: WAIT-SKUTTLE CO., OAKVILLE, ONT.

ELECTRIC
RADIANT HEATERS

HUMIDIFIERS



PERMANENT FILTERS

Acme
INDUSTRIES, INC.
JACKSON, MICHIGAN

manufacturers of
QUALITY
air conditioning
and refrigeration
equipment since 1919



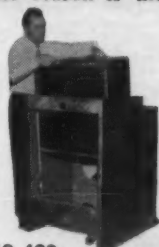
recognized
industry-wide



**Acme's NEW
FLOW-COLD®**
cooling towers

... the lightest, most
compact ever developed

Surprising but true! This lightweight, compact tower delivers a full 7½ tons of cooling capacity at standard conditions. One reason is the new plastic Acme-Pak that stacks 515 square feet of wetted surface in a removable 37-lb. deck. This and many other advanced features are described in a new Flow-Cold Tower catalog that's free on request.



SEE THEM IN BOOTHS 418-420
ARI SHOW, CHICAGO

'Phone or write Acme for details

For more information about products advertised on this page use Information Center, page 59.

Air Conditioning Around The Universe

DETROIT—It might interest you to know that:

The dog-carrying Sputnik II is air conditioned, the Russians say. How, they haven't said.

Cooling Considered Office Efficiency Aid

Three hundred thirty out of 376 companies surveyed by *Dun's Review* considered air conditioning important for office efficiency. Two hundred ninety of the companies already have air conditioning and 59 others intend to buy it within three years.

The Montgomery Ward store in Salt Lake City, air conditioned this year with two Air-temp water chillers furnishing 176 tons of cooling, has all fans interlocked with the building's

fire alarm apparatus. All fans are halted if there is a fire anywhere in the store. D. A. Olsen Co., Inc. of Salt Lake City made the installation.

Carrier Corp. recently shipped its 4,000th centrifugal refrigerating unit, a 1,000-ton job, to help air condition the 208 S. LaSalle St. building in Chicago. No. 4,000 is one of two supplying chilled water to 1,470 Weathermaster units dispersed throughout the 20-story skyscraper.

Florida's largest resort hotel, the 620-room Carillon in Miami Beach, will open Dec. 15 completely air conditioned by two York centrifugal compressors of 20 tons each. Hill-York Corp. of Miami, in making the instal-

lation, used salt water from deep wells instead of cooling towers. The 5,000 ft. of piping constitutes one of the largest piping jobs in any Florida resort hotel.

Pittsburgh Hilton To Be Cooled to the Hilt

More than 75% of the 24,719 guest rooms in the Hilton hotel chain have been air conditioned. The chain spent more than \$8 million in a recent 12-month period on air conditioning. The new \$15 million Pittsburgh Hilton hotel, for which ground was recently broken in Gateway Center, will be completely air conditioned, too.

Last Aug. 9, the chain finished air conditioning completely the Conrad Hilton in Chicago. Called the largest hotel air conditioning project ever undertaken, it was completed in less than nine months, with the hotel conducting business as usual during the whole time.

The 1,600-ton cooling system centered around two 800-hp. York Turbo water cooling systems serving 3,400 York induction room units. The job required 116,160 ft. of copper tubing, 54,815 copper fittings, 15,910 ft. of steel pipe, 30,000 ft. of insulation tubing, 18,200 ft. of spiral sheet metal air duct, and 13,500 ft. of special metal raceway.

As many as 60 steamfitters, 48 sheet metal workers, 14 insulation men, and 10 carpenters were employed at the height of the project.

The water cooling systems are capable of chilling 5,500,000 gals. of water per day. The room units supply 190,000 c.f.m. to the rooms. Entire system is controlled by a Minneapolis-Honeywell data center in the basement engine room.

The Smithsonian Institution is preparing to build two wings on its Natural History building

in Washington, D. C. Plans call for an air conditioning system intended to provide climatic conditions contributing to the preservation of scientific materials.

Recently opened Love Field Terminal at Dallas, claims to be the world's most air conditioned airport. The \$7,350,000 building is cooled by two 600-ton steam turbine-driven York centrifugal refrigeration machines. Two gas-fired water-tube boilers produce the steam. More than 70 air-handling units were also installed by Kieffer Plumbing & Heating Co., Dallas.

Wright-Designed College Buildings Get Cooling

The 18th and last Frank Lloyd Wright designed building on the western campus of Florida Southern college at Lakeland, Fla. will be started early next year. The campus represents the largest single collection of Wright designed architecture anywhere in the world. Air conditioning, heating, and wiring for the buildings on the campus was supplied by Engle Electric Co. here.

Two 40-hp. chilled water air conditioning systems were installed in Computer Building "B" at the U. S. Navy's David Taylor Model Basin at Carderock, Md. One system is for comfort and the other cools the LARC computer, which is the latest type computer, an improved model of UNIVAC.

John Quincy Adams Barn Sports Air Conditioning

An old barn near Boston, built by John Quincy Adams, sixth president of the United States, was recently air conditioned by an Armstrong Furnace Co. unit. Interstate Equipment Co. of Boston made the installation for the Nightengale Oil Co., present owner of the barn.

A dazzling blue aluminum apartment building in Memphis, Tenn., first apartment-skyscraper to employ blue curtain walls of aluminum, provides air conditioning for each of its 128 apartments from a central 180-ton unit.

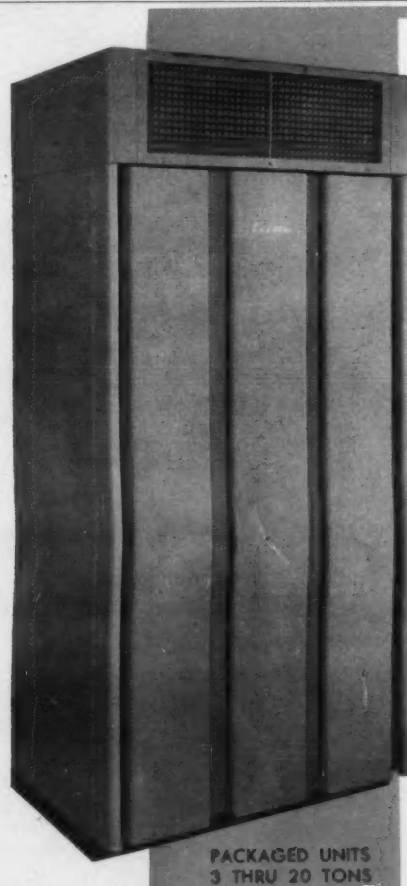
Special System Preserves Pre-Historic Paintings

A special system of air conditioning is preserving primitive paintings in the pre-historic Altamira cave in Spain.

A 121-year-old dormitory on the Princeton university campus in Princeton, N. J., is being replaced by a modern, air conditioned \$500,000 campus store.

A new 40-story metal and glass office building will soon rise in Montreal, Que., Can., to provide 1,500,000 sq. ft. of air conditioned space for Canadian businessmen. At 550 ft. high, it will be Canada's tallest building.

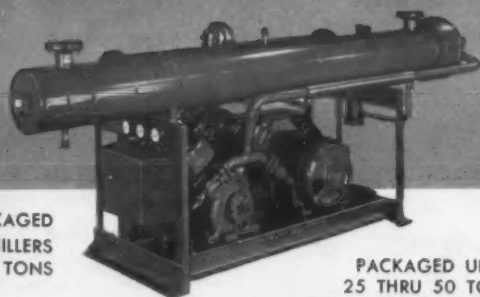
Installation of an electrostatic precipitator, four cyclone type, and two water wash dust collectors and other equipment has reduced dust discharge at the Columbia Southern Chemical Corp. in Jersey City, N. J. by 90%. Before the installation, neighbors had complained to the city about the dust.



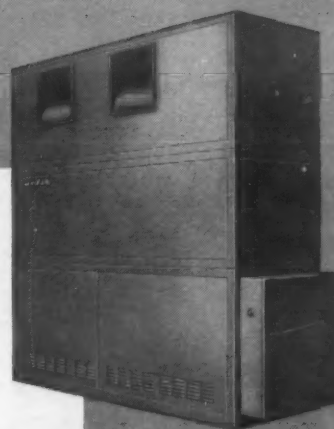
PACKAGED UNITS
3 THRU 20 TONS



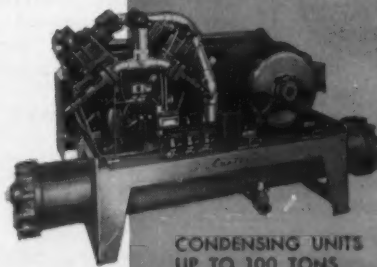
PACKAGED AIR
COOLED UNITS
UP TO 7½ TONS



PACKAGED
LIQUID CHILLERS
UP TO 100 TONS



PACKAGED UNITS
25 THRU 50 TONS
INTEGRAL EVAPORATIVE
CONDENSER OPTIONAL



CONDENSING UNITS
UP TO 100 TONS

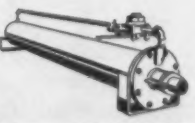
CAN COUNT ON
REMEMBER...
JOY

Curtis

OUR 103rd YEAR
MANUFACTURING COMPANY
REFRIGERATION DIVISION
1912 Kienlen Ave. St. Louis 20, Mo.



INDUSTRIAL
AIR COMPRESSOR



AIR HOISTS
AIR CYLINDERS



AUTO LIFTS

MAY BE THE ANSWER!

Curtis has been in business for 103 years and through experience has learned how to maintain a mutually profitable relationship with our franchise holders. Curtis equipment is competitively priced, quality built, and nationally advertised.

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AIR CONDITIONING & REFRIGERATION EXPOSITION
INTERNATIONAL AMPHITHEATRE — CHICAGO — NOV. 18-21

LOOK AT THE CURTIS LINE

Too Much Filter? Yes? No?

Should the FHA require 1 sq. ft. of filter area for every 300 c.f.m. in residential air conditioning?

FHA's new Mechanical Engineering Bulletin ME-13, requires it if the home is to be eligible for FHA financing. But, as the NEWS pointed out in its Oct. 21 issue, present residential air conditioning equipment does not provide this much filter area. This was brought to the attention of FHA and the Air-Conditioning & Refrigeration Institute. Efforts are now being made to correct the requirement.

However, bringing the matter to light also brought letters from readers. Some feel that the requirement should stand; others say it is unworkable. What do you say?

Good Idea! Says Texas Serviceman

Almar-York Co., Inc.
Fort Worth, Texas

Editor:

Subject: "Who Threw the Filter In FHA's ME-13?"

I noted an editorial on the front page of a recent issue of AIR CONDITIONING & REFRIGERATION NEWS by George M. Hanning entitled, "Who Threw the Filter In FHA's ME-13?"

We certainly have no idea who threw the filter in FHA's ME-13 but we operate a relatively large sales and service organization and due to the many "nuisance" service calls caused by dirty filters that were too small to begin with, we defy any service organization to say that the filter sizes stated are not a good idea.

It seems to me that the only way we can have better year-round air conditioning jobs is to have a starting point somewhere whereby the manufacturers toe the line, and I personally know of no other better starting point than the filters.

A. W. STUBBEMAN, SR.,
President

Impossible To Live With — ASRE Tech. Secretary

The American Society of Refrigerating Engineers
New York 1, N. Y.

Editor:

We should like to comment on your article "Who Threw The Filter In FHA's ME-13?" in the October 21 issue of ACRN.

As you indicated in your article, the FHA representatives seem to be pretty certain that the factor of 1 sq. ft. total filter face area per 300 c.f.m. of air was derived from an ASRE or ASHAE standard.

I have checked our standards which are now in effect and particularly Standard 16-56 which is concerned with the testing of air conditioners, and can find no specific requirement as to size or content of air filters to be used with residential equipment.

In the standard rating conditions established in our Standard 16-56 for all types of equipment, it is stated that filters should be "new and clean." This is the only requirement which I can find that deals specifically with filters.

I should also like to comment on the general subject of filter size. It seems to me there are two characteristics which are not considered in requirements as now established by ME-13.

First of all, it seems unlikely that a requirement for filter size would be based on sq. ft.

per unit of c.f.m. of capacity since this neglects the highly important detail of "thickness."

In a quick run-down of the filter sizes as published in the listings for residential equipment, you will find that the sq. ft. of face area varies considerably and that the thickness of the filters varies from 1/2 in. to 2 in. for the same size of total face area.

Obviously, the 2-in. thick filter would be considerably more effective than the 1/2-in. thick filter unless the density of the filter material were such that its effectiveness were only one quarter that of the 1/2-in. filter. This would seem to be unlikely.

The air conditioning industry should certainly be appreciative of the close study given to ME-13 by your correspondent. If this discrepancy had not been brought to light it is quite possible that equipment manufacturers would have to live with an "impossible" requirement.

This certainly is an indication of the need for increased cooperation between industry groups and governmental regulatory groups. The ASRE is endeavoring to establish close liaison with those segments of the federal government allied with standards.

ANDREW, T. BOGGS III,
Technical Secretary

Recommended, But Not Required—ASHAE

American Society of Heating & Air-Conditioning Engineers
New York 13, N. Y.

Editor:

In reply to your inquiry regarding an ASHAE standard for residential air conditioning units, we wrote you that we knew of no ASHAE standard recommending air capacity per square foot of filter area.

While the above statement is correct, we have noted that the 1957 GUIDE, Chapter 16, page 422 does contain a recommendation that in residential warm air furnaces, the maximum velocity, based on nominal filter area, should not exceed 300 f.p.m. This is, in effect, the same as limiting the capacity to 300 c.f.m. per square foot of nominal filter area.

The GUIDE is not an ASHAE standard, but "reference mate-

rial on the design and specification of heating, ventilating, and air conditioning systems based on—the Transactions—the Investigations of the Research Laboratory and Cooperating Institutions — and the Practice of Members and Friends of the Society." The GUIDE presents recommendations based on either research, accepted practice, or both.

It is possible that the requirement of the FHA bulletin ME-13, mentioned in your letter of October 1, is based on the above recommendation in the 1957 GUIDE, rather than on an ASRE or ASHAE "standard."

CARL W. MACPHEE,
Technical Assistant

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

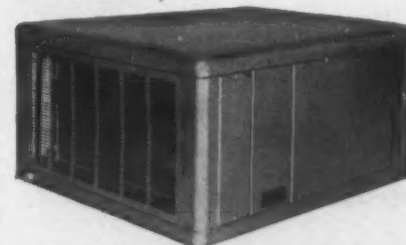
MAXIMUM EFFICIENCY in MINIMUM SPACE...

The BOHN CH Ceiling Unit Available in 2, 3, 4, 5 and 7½ tons capacities



The Bohn Ceiling Unit is a horizontal type blower evaporator, ceiling mounted for air-conditioning stores, shops, offices, restaurants and similar installations. Its attractive cabinet permits mounting directly in the conditioned space or the unit can be remotely mounted and connected to a duct system. Space for steam or hot water coil permits simple conversion to year-round air-conditioning and heating unit. Sectional side panels for easy inspection and maintenance. Filters removable from either side. Full rated 400 CFM per ton. Available in duct or grille models. Buy the known line—the Bohn line.

- easy and economical to install and service
- silent, trouble-free operation
- insulated to eliminate sweating and absorb sound
- attractive, compact, heavy gauge bonderized steel cabinet with durable hammertone enamel finish
- built-in drain pan



Rear view of Bohn CH Ceiling Unit



Manufacturers of Commercial Refrigeration, Industrial Air Conditioning and Special Heat Transfer Surfaces

BOHN ALUMINUM & BRASS CORPORATION • BETZ DIVISION • DANVILLE, ILLINOIS

For more information about products advertised on this page use Information Center, page 59.

They'll
Do It
Every
Time

by
Jimmy
Hatlo



Is Accelerated Scientific Progress Ignored By Our Industry?

(Concluded from Page 1)

(Off-stage voice: RCA, G-M, and several manufacturers who support the Franklin Institute are investigating the Peltier Effect, which is a no-parts refrigerating system that passes an electrical current through allergic metals and alters temperatures in the process. So far this theory hasn't become practical.)

Indeed, we are improving our stuff—making it more efficient, more convenient, better looking. And we have reduced prices at the expense of profits for makers and sellers (rather than through better designing or the adaptation of radically different ideas).

Essentially, though, we are producing the same complicated machines, out of pretty much the same materials.

Scientific "break throughs" therefore would seem to be overdue in our industry. Advancements which are occurring rapidly in chemistry, physics, metallurgy, and electronics nowadays aren't being matched in our business.

Who and where are the inventors whose bold imagination could revolutionize our products? Are their lights "hidden under a bushel," or haven't they been encouraged sufficiently? Good questions, these.

In rebuttal, and with justice, engineers and business managers in this highly commercial and combative industry can submit:

(1) Profit margins have been too low to admit adequate long-term research.

(2) Excessive competition has put a premium on precious refinements and conversation-piece "features" which can be sold right away.

(3) Those impressive scientific "break throughs" in other industries largely have been subsidized by governments in search of Ultimate Weapons.

All these allegations are true.

But they overlook one highly significant detail, to wit:

Spectacular scientific advances fostered by War Research probably could be utilized by our industry—but haven't been.

At random we cite these possibilities:

(1) **Metallurgy.** To our knowledge, there isn't a single qualified metallurgist—who does nothing else but study what could be done with different types of alloys—on the staff of any compressor manufacturer in our business. Yet, skills of alloying familiar metals with the less familiar—such

as boron, zirconium, and titanium—have advanced fascinatingly in recent years. Most of these discoveries have been applied to those drastic temperature differentials suffered by military "hardware" (airplanes, submarines, missiles). Our industry is based on temperature control, too.

(2) **New Materials.** By-products of the atomic bomb are creating entire new families of irradiated plastics—so different from their predecessors, and so much stronger and more versatile—that the word "plastics" no longer describes them. Likewise, the "alchemy" in which radioactive bombardment alters molecular structure is creating whole new groups of metallic materials. The automotive industry is studying their conversion. Ballistics confabulators already are using them. We aren't even trying, as a matter of fact. Who's asleep? Or too busy with "now" to provide for the future?

(3) **Revolutionary Power Sources.** Presently our industry is tied to electricity, gas, hydrocarbon refrigerants, fresh water, and air as sources of power and motility. What about rare gases, the fuel cell, photon-power, desalted sea water, or solar radiation as they might affect our products some time ahead? Other industries are studying them. Why don't we? To be sure, these things may seem remote AS OF NOW, and not germane to our urgent production and selling problems. In this age, however, the industry which doesn't look 20 years ahead TODAY may fall behind within five years. Never can tell how a seemingly out-of-this-world scientific discovery can be applied practically to any commercial product until you try.

(4) **Simple Assemblies.** Thanks to government subsidy, guided missiles (which eventually will transport our grandchildren to the Moon, Mars, and almost anywhere) have cast off old-time strait-jackets. Time-and-labor-consuming assemblies have been replaced by wholesale conjoining processes like giant extrusions and epoxy adhesives. (In the automotive field, Chevrolet's simple-assembly plastic Corvette is a pioneer.) Why can't we think about these short-cut methods in connection with our own laboriously and minutely assembled devices? Contractors and dealers are crying for built-in-at-the-factory simplification of the products they sell and must install and service with perpetually inadequate staffs. They'd love it if the number of parts in our products were reduced significantly.

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(5) **Revolutionary Ideas.** So far our industry's growth has been *evolutionary*—slow and conservative. Yet, we are living in an age of *revolutionary* scientific explosions. To keep pace, our industry needs start-all-over-again inventors . . . men brave enough to forget all past methods . . . courageous enough to strike out bravely on new tacks.

Frankly, this editorialist can make no suggestions as to how such creative "break-throughs" can be accomplished. He's a mechanical moron, and admits it. But surely the United States of America—home of free and independent spirits, proud father of inventors—can spawn and encourage individual creativeness as applied to radically new methods of cooling, heating, air conditioning, and home equipment (automatic labor-saving appliances).

All we can say is that adaptation of recently discovered materials (like plastics and ceramics and alloys)—plus new production methods (like automation)—could cut our manufacturing and installing costs, perhaps surprisingly. Thus we could increase markets and profits for everyone in our evergrowing industry.

Truly, our business has a marvelous opportunity to "hitch-hike" its way to extraordinary success on the backs of scientific discoveries for which we all have paid taxes.

If we have the will and the imagination to take a new look at those discoveries registered recently by physicists and chemists, and *hitch-hike on them*, the sky literally could be the limit for our future progress.

P.S.: And we could make it profitable.

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'Broaden Selectively Into Heating Line'**Wholesaler Urges Stocking Controls, Replacement Assemblies, Burner Parts**

FIG. 1—Heating controls are a "natural" for the independent air conditioning and refrigeration supplies wholesaler, because controls as a type of product are an item with which the wholesaler is exceptionally familiar. Some of the large stock of heating controls handled by Allied Supply Co., Dayton, is shown here.

DAYTON—Many independent wholesalers of air conditioning and refrigeration supplies and equipment have broadened their activities into the heating supplies and accessories field, but Jack Homan of Allied Supply Co. here, who has taken the step successfully, believes that the move will most likely meet with success if it is done on a selective basis.

'SOME ITEMS FIT WHOLESALE'S WAYS'

"By being selective, I mean there are some items that fit in with the air conditioning and refrigeration supplies wholesaler's ways of doing business, the kind of customers he serves, and the facilities he has to stock the items involved.

"For example, controls for all kinds of heating systems are a 'natural' for the wholesaler because controls for cooling systems have always been among his top items.

"Replacement assemblies and parts for oil and gas burners represent another kind of item that fits into the business nicely," Homan pointed out. "They usually consist of standard parts, well labeled, which are easy to identify, handle, and warehouse."

But when the wholesaler begins to consider handling sheet metal ductwork and duct connections and fittings, he should pause and ponder whether this is the type of item that he is set up to handle.

'UNSOLVABLE PROBLEMS'

"If the wholesaler tries to go the whole way, and supply everything that a customer might want in the way of ductwork, he comes up against some problems in handling and warehousing that cannot be solved—to say nothing of what this can mean to his profits.

"Not too many parts and supplies wholesalers have the physical facilities to go all the way on sheet metal items. What's really needed is a place on the outskirts of town where you could add a big, unfinished warehouse for just such items.

"If the wholesaler doesn't want to go all the way on sheet

metal items, then he must decide if it's worth while just to handle some of the fittings. He's got to do the same about grilles, registers, and air diffusers."

"Black pipe" used in the heating field is another item offering some problems similar to sheet metal, but in general is not quite so difficult to handle. However, if the wholesaler decides to handle pipe, he will generally find it necessary to get the proper racks, pipe cutting tools, and other handling materials that will simplify the job.

Fittings for black pipe have proved a good item, Homan says, and they fit well into the wholesaler's operations. Service tools, testing and recording in-

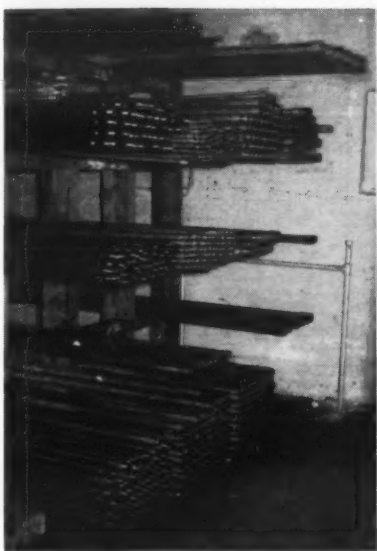


FIG. 2—Nearly a carload (40,000 lbs.) of black and galvanized pipe for the air conditioning and heating trades are stored on these specially built racks at the Allied Supply Co. This kind of pipe represents an item which the supplies wholesaler can readily set up to handle, says Jack Homan, head of Allied Supply.



FIG. 3—Partial stock of pipe fittings is neatly stocked on shelves. Homan calls attention to the fact that the fittings are boxed, thus making it unnecessary to provide special bins. Pipe fittings boxed are available from a number of sources, he points out.

struments, and other accessories of this type for the heating field are among the other items which have been added by the wholesaler.

Allied Supply Co. also handles parts and supplies for the electronics field, and Homan believes that industry is well ahead of the air conditioning and refrigeration and heating fields in labeling, packaging, and merchandising methods.

"It is not just for the wholesaler's convenience that items should be properly and intelligently labeled, packaged, and merchandised," says Homan. "They sell better when some attention is given to this."

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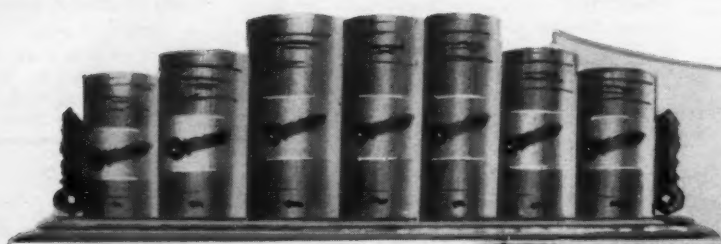
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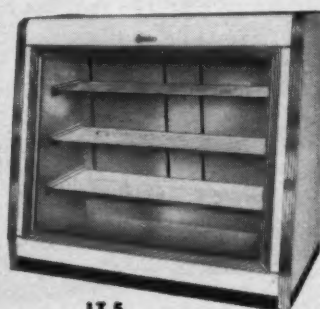
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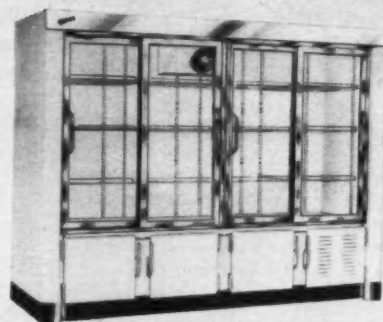
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LT 5 Rear View



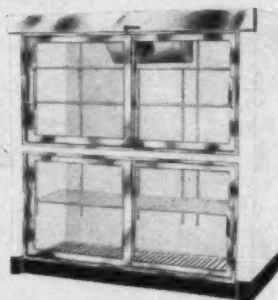
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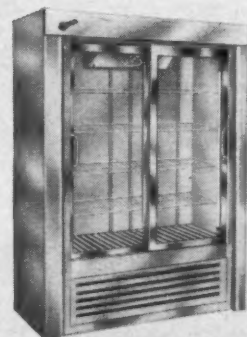
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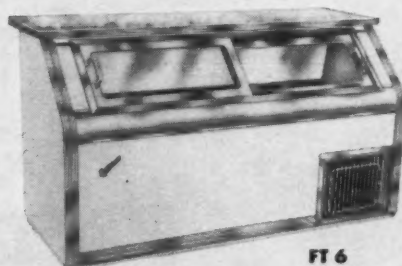
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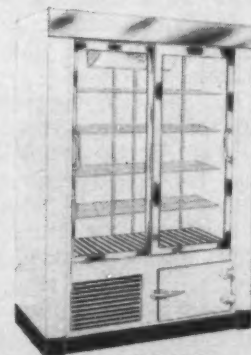
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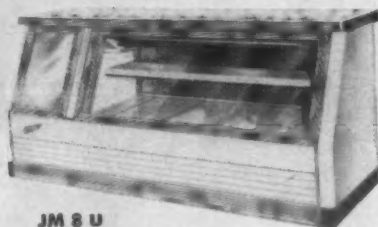
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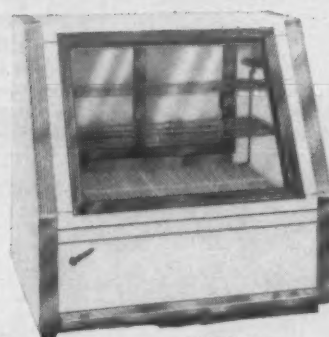
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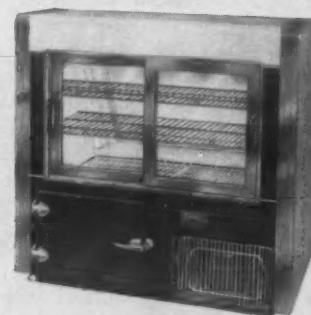
JM 8 U



JM 8 U Rear View



DL 52 SC



DL 52 SC Rear View

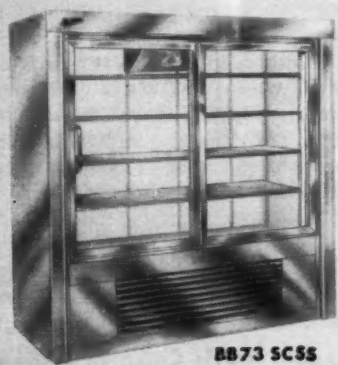
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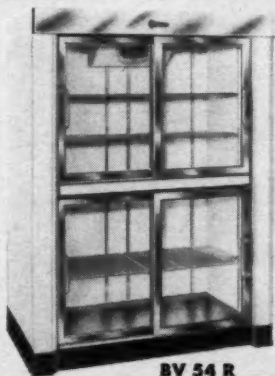
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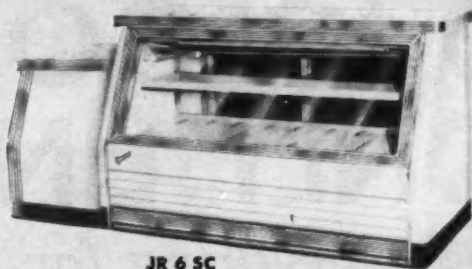
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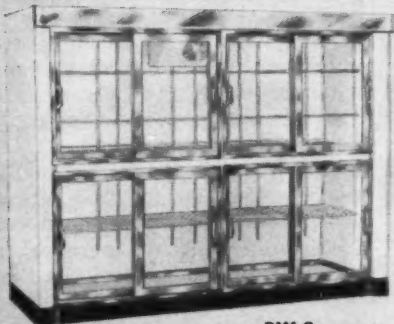
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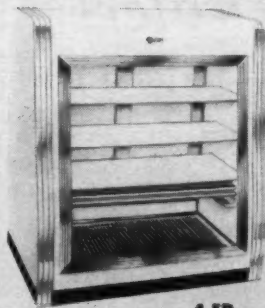
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JR 6 SC



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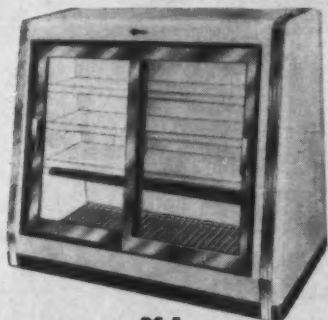
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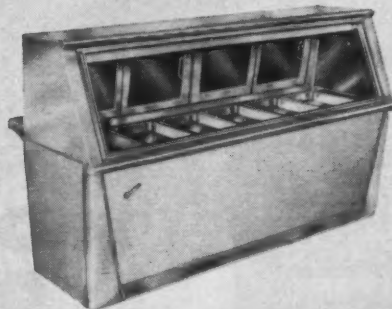
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SJ 6 and JR 6 Front View



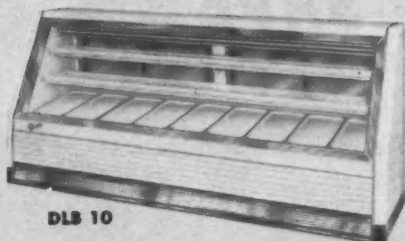
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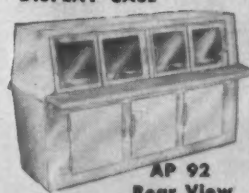
AP 92 APPETIZING & SALAD DISPLAY CASE



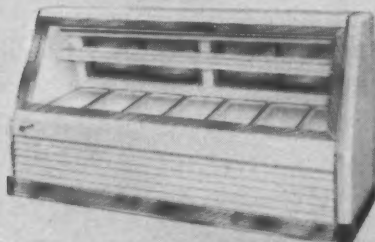
SJ 6 Rear View



DLB 10



AP 92 Rear View



DBM 8

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Time Charges

Groups, Men Who Repair Durable Goods Are 'Ill-Trained, Overcharge,' Current Shortage Hurts Consumer

DETROIT—The organizations and the men who repair the nation's consumer durable goods got a pretty good going over in a "cover story" (top feature of the issue) in a recent issue of *Time*, the weekly newsmagazine.

The general conclusion that *Time* draws in its discussion is that today's serviceman is a poorly trained incompetent who overcharges for generally inferior work. It is indicated that the public will have to bear with this until all products will have "plug-in motors and control units" which the repairman will take out, replace with a substitute, and ship the original back to the plant. (*Time* doesn't speculate on what this will cost

the individual consumer.)

The following excerpts from the article offer interesting fact and opinion from one of the nation's top news magazines on the state of the durable goods repair business today:

'Special Niche In U. S. Folklore'

"The U. S. repairman has long since won a special niche in American folklore. Depending on the circumstances, he ranks midway between the river-boat cardsharp and the village idiot, part free-booting buccaneer and part plain boob; or he appears, armed with a screwdriver and flashlight, as a latter-day St. George riding heroically against

the dragons that infest the nation's drank traps and fuse boxes. In commuter's cars, at cocktail parties and women's clubs, he is the center of a game of 'Can you top this?'—an endless recital of domestic triumphs and defeats. . . .

"What can anyone do but deliver himself into the hands of the repairman, whose burgeoning ranks are the measure of his importance? From less than 1,000,000 in 1940, the ranks have nearly doubled to 1,800,000. All told, the repairman is the proprietor of a business grossing \$16.6 billion annually, more than the total retail sales of clothing or home furnishings. TV repairs last year alone cost

nearly \$2 billion, more than the value of all new TV sales; electrical appliances added another \$1.6 billion. . . .

"Better Business Bureaus in cities from coast to coast answer thousands of complaints annually from customers who have been fleeced by crooked repairmen. For every case in the files, a dozen others go unreported—or unrecognized. To date, the efforts to clean up the repair industry have resulted in licensing laws for various types of servicemen in several states.

'Licensing Repairmen Lets Them Operate Fraudulently'

"But Leland S. McCarthy, chief of Washington's BBB, thinks this is no solution since a licensee lulls the household and is no guarantee of honesty. Says he: 'Licensing repairmen is like giving them a license to operate fraudulently. . . .'

"Actually, the great majority of repairmen are honest enough. The difficulty is that no one can tell the good from the bad—so many are merely incompetent. And the shortage is so great that almost any repairman is a foul-weather friend. . . .

"Many of the brightest post-war candidates who enrolled in trade or company run schools to learn to repair autos, appliances, etc. soon quit for better-paying jobs in industry. An apprentice TV or auto repairman gets only \$1.25 an hour, often has to work six days a week, while inexperienced production-line workers get up to \$2—and do not have to face irate customers while they learn.

"The Automobile Manufacturers Association estimates that U. S. garages are short at least 40,000 good mechanics, and that about 40,000 new ones will have to be trained each year just to take care of retirements and keep up with the outpourings of new cars.

"Bedeviled by the lure of the white-collar job, trade and vocational schools have fallen far short of keeping up with the demand because (1) teenagers can also earn high salaries in industry without a trade, and (2) the schools need such a sizable investment in mechanical equipment that they cannot expand fast enough. . . .

Repairmen's Counter Charge

"Repairmen also complain that U. S. industry's soaring production schedules are the bane of their business. 'Never in the history of the appliance industry have we had a time when so much faulty merchandise was being received,' says Al Bernsohn, vice president of National Appliance & Radio-TV Dealers Association. In a recent sampling, 70% of the members polled reported an increase in broken appliances from the factory. Railroad-salvage salesmen bucked them on to cut-rate retailers, and the discounters in turn passed them on to the public, leaving the independent repairman to handle any troubles. . . .

"But the repairman's biggest, loudest beef of all is directed squarely at his meal ticket—the appliance owning U. S. public. 'The public has more chiselers and stupid jerks in it than any place else,' says an angry Pittsburgh appliance dealer. 'Everyone wants a bargain, but when the cutrate \$100 TV set goes fizzle and the repairman's bill comes to \$25, the customer refuses to pay.'

"Manufacturers are partly to blame, while the auto owner has learned by long experiences to expect occasional repairs, few appliance makers emphasize the question of service. Even so, say repairmen, the public usually brings much of the trouble on itself. Some 30% of all service calls are 'nuisance' calls, such as explaining the operation of the appliances to people who never bother to read the instructions and argue, as did one Washington matron: 'Why should I? I know how to run these things without reading about them. . . .'

"Says Detroit Edison's Service Boss William R. Milby: More companies should 'create a design with service in mind.' That means a certain amount of interchangeability. We think a manu-

(Concluded on next page)

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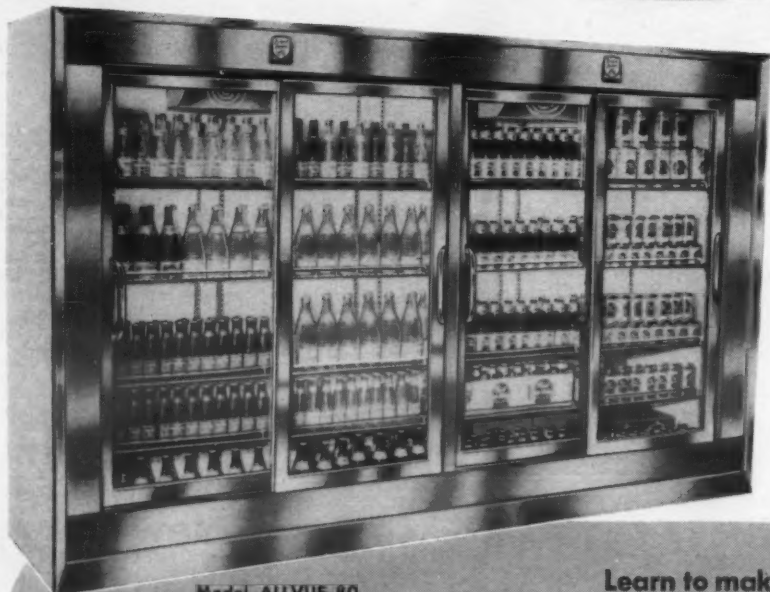
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Kramer Unit--

(Concluded from Page 1, Col. 2)

What Kramer-Trenton is offering in its new line is a complete "Thermobank" system factory assembled as a package. All the electrical, refrigerant, and protective controls are factory set and assembled; they are completely wired ready to operate.

Just One Field Connection To Make

Thus, the only connections to be made in the field are those between the compressor package and the evaporator. This would include the liquid, suction, and hot gas lines. The relative position or distance between the high side and low side is not limited.

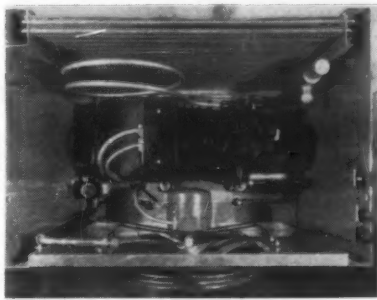
"Thermobank" is the name given to what Kramer-Trenton calls "the original and only automatic re-evaporating hot gas system" introduced some 13 years ago. Now all of the components used in a field installation are factory assembled except for the evaporator and heat exchanger.

Now in this new series of models all the components used in a field installation are completely factory assembled except for the evaporator and heat exchanger. This includes the compressor, "Unicon" air-cooled condenser, bank (re-evaporator), timer, drier, motor starter, control box, evaporator fan switch, pressure switch, refrigerant controls and valves (expansion valves are not furnished).

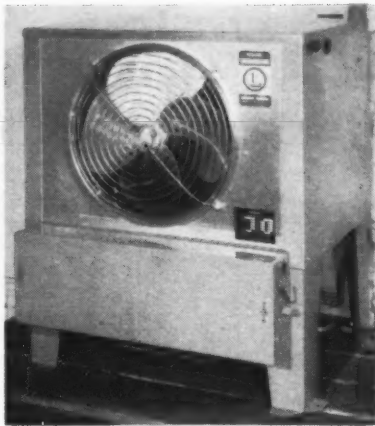
Casing 'Easily Removed'

All of the components are enclosed in a tamper-proof case. The casing is so designed that it can be removed easily and quickly by the serviceman for ready access to all parts. With the tamper-proof casing, say Kramer-Trenton officials, the assembly can be installed in locations that formerly could not be used for condensing units.

The "Thermobank" defrosting system stores heat during refrigeration for use in re-evaporating liquid refrigerant that



INTERIOR of Kramer "Thermobank" compressor unit shows compressor, air-cooled condenser, fan and motor, hot gas solenoid valve, strainer, and suction pressure regulating valve.



TAMPER-PROOF case on compressor is factory-assembled and tested for low temperature use.

condenses in the cooling coils during the defrost operation. This extra heat picked up in the "bank" or re-evaporator, in addition to providing a rapid defrost action, also prevents liquid refrigerant from returning to the compressor.

The new assembly includes the Kramer ice coat control

which automatically adjusts the number of defrost operations to the rate of accumulation of frost on the cooling coils.

Another accessory is a suction pressure control which prevents overloading the compres-

sor motor during the defrost or refrigeration operation.

Through the elimination of liquid return to the compressor, there is no oil foaming and the resulting oil pumping and lubrication problems, say Kramer officials. Thus, they point out, the assembly may safely use a low temperature designed compressor permitting the compressor motor to be fully loaded during the refrigeration cycle.

An extra large air-cooled condenser is used. The Thermobank compressor may be located either indoors or out-of-doors. The standard unit will function satisfactorily when located in an area of 50° F. or higher. For systems where the air temperature at the condenser is likely to fall below 50° F. the patented Kramer "Winterstat" is assembled as part of the system, and will provide sufficient refrigerant pressure for proper

operation of the expansion valve and insure rapid defrost.

Ratings Listed as System Capacity

Ratings are listed as system capacity, and the compressor is designed for maximum system capacity. Tests show that for low temperature a substantial increase in system capacity is gained by mounting the heat exchanger outlets of the refrigerator immediately at the point of entry of the refrigerant lines into the box. In this arrangement the liquid refrigerant is cooled as it goes into the refrigerator; thus relieving the system of a significant heat load.

Thermobank compressor systems are now available for 0° to -20° F. applications, in sizes up to 7½-hp. capacity. Range of the line will be increased later, company officials stated.



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NEW!
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SEE HEATWAVE'S NEW Condensing Unit

It's a new remote condensing unit designed for new or existing warm air installations. Check these outstanding features!

VERTICAL HOT AIR DISCHARGE! All hot air is discharged upward to prevent any damage to surrounding shrubs and grass.

EASY TO SERVICE! Detachable valves, oil sight glass, liquid sight glass, moisture indicator and dryer and standard parts in this unit minimize service problems.

CONSTANT AIR FLOW! Regardless of wind direction this new Heatwave condenser maintains its rated CFM.

ECONOMY! A larger condenser face area gives lower operation head pressure and a lower liquid temperature. Resulting in lower operating costs.

SEE ALL THESE FEATURES AND MORE IN THE NEW HEATWAVE CONDENSING UNIT!

SEE HEATWAVE'S NEW Gas-Fired Furnace

JUST 71 INCHES HIGH OVERALL! This new unit is designed especially for year 'round air conditioning in installations where overhead space is limited. The evaporator coil and housing are recessed into the unit's top to give a new, lower overall height.

A WIDE RANGE OF SIZES! This new Heatwave furnace is available in models ranging from 75,000 to 135,000 BTU input. All designed to deliver proper CFM with 2, 3, 4 and 5 horsepower.

ADD COOLING LATER! The new Heatwave furnace is designed to allow the addition of the evaporator cooling unit at a later date without altering existing ductwork.

SEE THIS NEWEST OF ALL DEVELOPMENTS IN YEAR 'ROUND AIR CONDITIONING.

SEE HEATWAVE'S NEW Hermetic Condensing Unit

FOR EXISTING SYSTEMS! This new hermetically sealed unit can be used in existing heating systems.

FOR HOT WATER OR STEAM HEAT SYSTEMS! Heatwave's hermetic condensing unit makes air conditioning possible in installations using hot water or steam heat where normal application is not possible.

FULLY RATED! The new hermetic unit has fully rated capacities. Rated under strict A.S.R.E. conditions in Southwest's own laboratory.

SEVERAL MODELS! This self-contained unit is available in 2, 3, 4 and 5 horsepower models.

SEE THE MANY COOLING APPLICATIONS THIS NEW UNIT MAKES POSSIBLE.

See These New Developments and More!

Learn about Heatwave's expanding program.

VISIT BOOTH 671 during the Air Conditioning and Refrigeration Show.

Repairmen--

(Concluded from preceding page)

facturer should try to make his '58 models at least somewhat the same as his '57 models—that is, they should use only six kinds of bolts instead of 18. . .

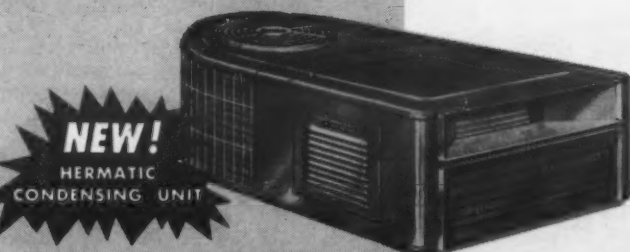
"As gadgets become increasingly complex—and repair bills mount—every businessman is attacking the problem at all levels, from the small local repair shop up to the factory.

'Big Firms May Control Own Repairs'

"Eventually, big companies may control all their own repairs. Westinghouse Electric Corp., the nation's third biggest appliance maker, is already working in that direction. Two years ago the company polled 10,000 U. S. housewives to find out what was important to them. The No. 1 item: service—63% of those who were satisfied with service said they would buy the same brand again; only 39% who were dissatisfied were willing to try again. Today product service is a separate division at Westinghouse.



NEW!
GAS-FIRED FURNACE



NEW!
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Settle Patent Suit Involving Mixing Valves, Thermostatic Controls Without Cost to Either

NEW YORK CITY—Robertshaw-Fulton Controls Co. and The Dole Valve Co. have effected a settlement of a three-year-old patent suit involving charges and countercharges of infringement of patents relating to mixing valves for washing machines and other thermostatic controls, it was announced by Robertshaw-Fulton.

In the settlement, Robertshaw-Fulton obtained license rights for controls in the laundry machine field and Dole, likewise, obtained rights under Robertshaw-Fulton owned patents charged to be infringed, it was stated.

The suit is being dismissed without costs to either of the parties.

Fastener Firm Opens Midwest Quarters

GARDEN CITY, N. Y.—All-metal Screw Products Co., Inc. recently announced the opening of a new Midwest Div. headquarters which is located in Chicago.

Located at 5611 W. Lake St., the operation is slated to be headed by Tom Schaid, a five-year veteran in the fastener field.

No Extended Warranty

Servicemen Hear Tecumseh's Policy on Warranty; Discuss Hermetic Service

TECUMSEH, Mich. — Tecumseh Products Co. guarantees its hermetic compressors for 20 months after the date of manufacture only and does not have an extended warranty.

This fact was emphasized to 110 servicemen from all over Michigan who gather at the Tecumseh plant here recently. They came to take advantage of an unusual opportunity to quiz Tecumseh service and engineering officials for answers to their problems.

The meeting was a clinic activity of the Michigan Association of the Refrigeration Service Engineers Society. It was chaired by Ed Vander Kolk of Grand Rapids, state educational chairman.

Must Go To Equipment Maker for 5-Year Warranty Redress

Hal Kelso, Tecumseh sales service manager, denied that Tecumseh lent its name to any five-year warranty. It is the equipment manufacturer who puts the compressor in his product that stands behind the extended warranty, Kelso emphasized. It is to him that the serviceman or dealer should go for redress.

Kelso further reminded the servicemen that Tecumseh's new policy wherein wholesalers handle in-warranty replacement compressors applies to Tecumseh's warranty, not to the equipment manufacturer's extended warranty.

He pointed out that the year of manufacture with a code letter to indicate the months is stamped on each compressor. The code letters run from A to M, omitting I, one for each month.

On the platform with Kelso to answer the servicemen's questions were Jim Elliott, Bill MacBeth, and Ted Pihl of the engineering department and

Hugh Walters of the service department. Harry Spencer, executive vice president of production, greeted the men to start the session off.

Here are some of the questions raised and the answers given:

What is the biggest source of trouble you find in the compressors that come back to the factory?

Returns Due to 3 Major Complaints

Kelso: There are three major complaints that account for most of the returns. The biggest of these is noise. The customer complains of a noisy compressor so the dealer feels he has to change it. Sometimes they are excessively noisy. But many times, it's a relative matter. It seemed noisy to that customer, though the some compressor would operate without complaint in another application.

Second major cause of returns is a "stuck" compressor. This may be caused by scored, broken, or misaligned parts.

Third cause is burned out motors.

In 40% of the cases, I would say, there is nothing wrong with the compressor except that somebody said it was noisy. In about 20% of the cases, where a compressor is returned without anything wrong with it, we have no idea what happened to cause its return. The dealer didn't tell us. When there is something wrong, we can usually tell what happened from what we find in the unit.

Can oil be added to a hermetic compressor?

Elliott: Yes, oil can be added to a system. That's why the sight glass is there on larger units—to tell you whether or not there is enough oil. It must be a clean, dry oil that is added, (Concluded on next page)

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ALSO ELECTRICALLY HEATED DOORS
on request—optional
KING SIZE SERVUE DOORS



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ALL BARRDORS FEATURE:
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Electrically heated doors for high humidity areas.
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All doors are insert type, set into heliarc welded frame, and ready to place into any opening. Glass is two pane, hermetically sealed, bearing 5 year warranty.

Some desirable areas open for factory representatives.



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AFTER

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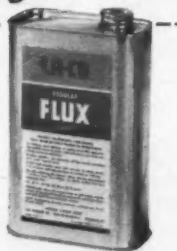
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Tecumseh Policy--

(Concluded from preceding page) though.

I have found it necessary to install a capacitor on replacement 1/8-hp. compressors in order to get sufficient starting torque. Why should this be?

Pihl: The Tecumseh 1/8-hp., pancake compressor is designed with a 10-oz. starting torque and is designed to operate on equalized pressure in a system with a capillary. This particular model should be able to start with as high as 60 p.s.i. equalized pressure at about 90% of the rated voltage.

Reasons for Failing To Start

Such a compressor would normally fail to start for one of two reasons. Either the line voltage is excessively low or there is a high pressure differential, rather than an equalized pressure.

In a general discussion on the function and use of capacitors, Pihl warned that a capacitor should never be placed with one carrying a lower voltage rating.

In replacing such capacitors, he pointed out, there can be a small deviation in a replacement starting capacitor, but the running duty capacitor must always be replaced with its exact counterpart.

Since the starting capacitor is parallel to the running-duty capacitor, a short in the former will not affect the latter. He warned that if a capacitor rattles when shaken, it means the conductor is loose in the mounting. That capacitor should not be used. (Running capacitors, on the other hand, are usually oil-filled.)

There was an unresolved discussion over whether a 10 microfarad capacitor, for example, rated at 330 volts would still be a microfarad at 440 volts.

'Replace Leaky Evaporator'

Can you repair leaks in an aluminum evaporator? There is a plastic leak repair kit on the market now that is supposed to fill up such leaks.

Elliott: I would not attempt to repair pinhole leaks in an aluminum evaporator. It would be much simpler to replace the entire evaporator. When a leak appears, the material around the leak has also deteriorated so that new leaks may quickly develop.

So-called plastic repair kits for dumping into a system are not recommended since it is likely that repeated expansion and contraction in the unit will tear away any spot of repair, whose coefficient of expansion will definitely be different than that of the metal.

Can a leaky terminal be tightened?

Elliott: The terminals have a maximum allowable 8 in.-lbs. torque salvage limit. Practically speaking, this means snug with an open end wrench. Never tighten so much that the gasket begins to extrude.

What is the critical oil level in a compressor? How far over and under the prescribed amount can you go in safety?

Elliott: I wouldn't go over the prescribed amount of oil, but you can stand less. In a unit carrying about 40 oz., you can

go under about 10 oz. without loss of lubrication.

Remember, when draining oil from the compressor, there will always be some oil left in the unit. This amounts to 3 oz. in a single cylinder unit and 5 oz. in a twin-cylinder compressor.

Utility Fan Expands Sales, Service Area

LOS ANGELES—Expansion of Utility Fan Corp. sales and service operations to the mid-west and eastern market was announced here by Manager Vance Smith.

Marcus McGuire, factory-trained engineer will head the new operation with headquarters in Chicago at 2828 Western Ave., in suburban Park Forest.

Utility Fan, a division of Utility Appliance Corp., manufactures blowers for air conditioning and air moving units.

3rd Canadian

Refrigeration, Cooling Exposition Due Feb. 10

TORONTO, Ont., Can.—Third Canadian Refrigeration and Air Conditioning Show will be held here in new Queen Elizabeth Exhibit Hall on Canadian National Exposition grounds Feb. 10-12.

Dealers, distributors, manufacturers, and members of allied societies will be in attendance, it was announced. A 57% greater attendance was achieved in the second show in 1956 over the initial 1954 show and show officials expect this one to climb even higher.

Air conditioning and refrigeration is claimed to be Canada's fastest-growing industry and the Canadian Refrigeration Manufacturers Association says all types will be on display.

Forms German Firm of VanderWall Elected Aluminum Mfg., Sales Ansul Mfg. Vice Pres.

LOUISVILLE, Ky.—Reynolds International, Inc., and Julius & August Erbsloeh of Wuppertal, Germany announced the formation of an aluminum manufacturing and sales company in Germany.

The new German firm will be named Reynolds-Erbsloeh G m b H, according to W. G. Reynolds, president of Reynolds International, Reynolds Metals Co.'s manufacturing and sales organization outside of the U. S. The new company will manufacture and sell Reynolds patented "Tubed Sheet."

"Tubed Sheet, in both two-side and one-side-flat forms, is expected to find wide usage in German appliance manufacturing and in other heat exchanger applications," the announcement said.

MARINETTE, Wis.—Clifford C. VanderWall has been elected vice president in charge of manufacturing of Ansul Chemical Co.

With this action, VanderWall's former title of director of manufacturing was abolished. He will continue to direct all chemical and mechanical operations of the company.

VanderWall is the second man to carry the title of vice president in charge of manufacturing since it was created in 1949. The title was held by Arthur C. Pope until his retirement two years ago.

Joining Ansul as a member of the engineering department in 1946, VanderWall became director of manufacturing in 1955.

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Kool-Pak* capacitor assembly



unique plug-in design for air conditioners

Here's a complete motor-start, motor-run capacitor assembly in the smallest possible space, with two Sprague capacitors perfectly matched to your own requirements.

It provides your customers with a more economical air conditioner that lasts longer, needs less service . . . and costs you less to manufacture.

Completely exposed, the capacitors in every Kool-Pak assembly last up to two to three times longer than they would stuffed into conventional box

packages. Internal heat is dissipated quickly by conduction and convection so that both the Clorinol® and the electrolytic capacitors are always far cooler. And another long-life advantage—there is no trapped moisture to corrode metal cases and parts.

Kool-Paks cost you far less because there's no outer box to pay for, no special leads or terminals to buy for interconnecting multiple capacitors. Another plus for Kool-Paks is the easier installation and easier field servicing.

Standard Kool-Paks are avail-

able for air and water-cooled 1 1/4, 2, 3, and 5 ton air conditioners. Mounting dimensions are identical with those of most present box capacitor assemblies. Control relays may be mounted inside the Kool-Pak junction box.

Complete information on new Sprague Kool-Pak Plug-in Assemblies for your air conditioners is available on letterhead request to the Technical Literature Section, Sprague Electric Company, 63 Marshall St., North Adams, Massachusetts.

Sprague on request will provide complete application engineering service for optimum results in the application of motor-start and motor-run capacitors.

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For more information about products advertised on this page use Information Center, page 59.

Design and Operation of Low Voltage Thermostats

1. Design Features and Built-In Control Devices

By Douglas S. Sterner, Sales Manager, Air Conditioning & Refrigeration Controls Div., General Controls Co.

Probably the most commonly-used automatic control instrument in the world today is the low voltage room thermostat. Yet, few people really understand their operation.

Purpose of this discussion is to help to create a better knowledge of how room thermostats operate and thereby clarify the many misunderstandings that are prevalent today:

DESIGN

Room thermostats are designed to measure a change in

air temperature in the room and to translate this measurement into action—of the furnace or the cooling unit. They are located wholly within the spaces which they control. They consist primarily of the following parts:

1. A temperature-sensing element or bimetal.
2. Electrical contacts to transmit temperature changes sensed by the bimetal to electrically-controlled devices.
3. A means of adjusting the

temperature control point.

4. A base.
5. A protective cover.
6. A thermometer is mounted in the cover.
7. Switches to control the heating and/or cooling system such as:

- a. On-off system switch.
- b. Heat-cool manual change-over switch.
- c. Fan or system blower control switch.

The temperature-sensing element is the heart of the thermostat. The sensing element must absorb heat from or dissipate heat to the surrounding air.

There are several types of temperature-sensing elements. For our purposes we will consider only the thermostatic bimetal, since this is in great preponderance in room thermostats.

The thermostat bimetal is composed of two or more layers

Used almost universally wherever cooling and heating systems are found, the room thermostat is taking on more importance as users seek, and engineers try to provide, closer control of temperatures for human comfort. The room thermostat is also performing new functions when used with year-round air conditioning systems.

Douglas Sterner is an engineer and sales executive with many years' experience in the field of controls as they relate to the air conditioning industry. He has presented discussions on the subject of the room thermostat before industry groups, and in this series of articles he offers a detailed summary of the design characteristics and functions of the room thermostat in its present applications. This is the first instalment in the series.

of metallic alloys having different coefficients of expansion and physical properties—for example, Invar and brass. One of these metals (Invar) may be considered the inactive metal since it has a very low coefficient of expansion, while the other (brass) is the active metal with a high coefficient of expansion. The two (or more) metals are

directly welded together at high temperatures.

The fundamental property of all thermostatic bimetals is their ability to change curvature with temperature changes. This property is translated into action by means of an electrical circuit.

The thermostatic bimetal as used in room thermostats takes three basic forms.

1. The cantilever in which the bimetal is a flat strip anchored at one end. (Fig. 1.)
2. The "U" shape in which the bimetal is formed into a "U" shape and anchored at one end. (Fig. 1.)
3. The spiral in which the bimetal is formed in the shape as described. (Fig. 1.)

The arrows indicate the direction of movement of the unanchored end of the bimetal on an increase in air temperature. An exaggerated example is shown on Fig. 1.

Each of the three shapes of thermostatic bimetals have certain advantages and all are commonly used. The "U" shape and the spiral have the advantage of combining desired sensitivity, greater movement and force into a smaller space, or envelope, and consequently their use is increasing.

ELECTRICAL CONTACTS

Electrical contacts are necessary to vitalize the characteristic movement of the bimetal due to air temperature changes to provide an electrical circuit to control the heating and/or cooling source.

An electrical contact can be attached to the moving or free end of the bimetal. This is called the moving contact. Another contact can be fixed to the base or cover and is known, of course, as the fixed contact. (See Fig. 2.)

When the temperature increases a predetermined amount, the moving contact moves up to and makes contact with the fixed contact. If a source of power is supplied to the fixed contact, current will flow from the moving contact to the fixed contact, and thus a control circuit is made. This circuit would be connected to a cooling source to provide for cooling, since this was indicated as being required by the rising room temperature.

In order to provide sharp make and break characteristics, a permanent magnet (or detent) is frequently located adjacent to the fixed contact.

If a moving contact were placed on the bottom side of the bimetal and the fixed contact affixed below it, you would have the electrical circuit completed on a drop in room temperature. The electric circuit so made would be connected to a heating source, causing heat to be supplied to the room.

With one set of contacts (one
(Continued on next page)



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Cleaners based on Du Pont Sulfamic Acid are safer, more convenient, non-fuming... dissolve in water to form effective, low-corrosive solutions

Now... powerful acid cleaners you handle *dry* with no hazardous fumes, no acid splashing! When added to water, these cleaners form solutions equal to hydrochloric acid in penetrating power, yet they're far less corrosive. The key

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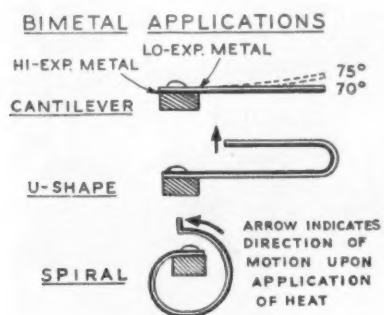


FIG. 1—Exaggerated example of movement of the unanchored end of the bimetal of a room thermostat on an increase in air temperature shown by arrows.

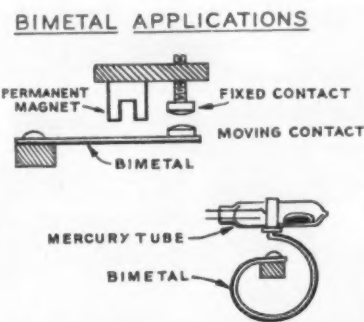


FIG. 2—If a mercury switch is substituted and attached to a spiral bimetal, in the operation of the thermostat the electrical circuit would be completed inside the mercury tube switch by the ball of mercury between the two electrodes inside the tube.

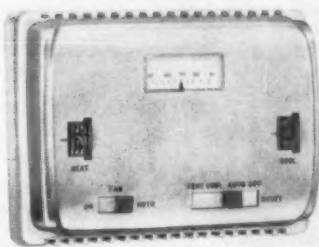


FIG. 3—This shows the cover of a typical combination thermostat with two switches, one for fan, one for change-over.

Low Voltage Thermostats--

(Continued from preceding page)

fixed and one moving) you can have either a cooling or a heating thermostat dependent on whether the contact makes on a rise in room temperature or on a drop in room temperature. If you have two sets of contacts (two fixed and two moving) you have a combination thermostat—one that will make a circuit on either a temperature rise or a temperature drop.

If, instead of the fixed and moving contacts we have just discussed, you substituted a mercury switch, attached to a spiral bimetal (Fig. 2), the operation of the thermostat would be the same as that just described, but the electric circuit would be completed inside the mercury tube switch by the ball of mercury completing the circuit between the two electrodes inside the tube.

An SPST tube can be attached to the bimetal so that the electrical circuit is made either on a rise or a drop in room temperature—and thus you have either a cooling or a heating thermostat. Two SPST mercury tubes on one SPDT mercury tube can be installed to provide control of both cooling and heating sources, and thus you have a combination thermostat.

The use of mercury tubes is increasing rapidly, since they provide silent, long-life, hermetically-sealed contacts—safe from dirt, dust, moisture, and corrosive substances.

ADJUSTING DEVICES

A temperature adjusting device is necessary on all room thermostats so that they can be adjusted to control at any specific temperature over a fairly wide temperature range (55°-90° F).

A calibrating adjustment is required so that a thermostat can be adjusted at the factory (or in the field) to control at the actual temperature as set by the temperature adjusting device.

OPERATING DIFFERENTIAL ADJUSTMENT

Differential in a thermostat is the change in room air temperature conditions necessary to start or stop the cooling or heating source. Since it is sometimes desirable to vary the differential, some thermostats have a differential adjustment.

The base, cover, and thermometer are typical and basic parts of the room thermostat. The size and shape that they take is dictated by the functional requirements of the thermostats and esthetic tastes of the designer.

CONTROL SWITCHES

Control switches built into room thermostats have come to the fore with the advent of residential air conditioning systems

requiring combination thermostats. There are a number of different switches available, and one photograph will be sufficient to illustrate the extreme flexibility of these control switches.

Fig. 3 shows the cover of a typical combination thermostat. Note especially the two switches. One is a FAN switch. The other is a CHANGE-OVER switch.

An interesting feature of this

specific change-over switch is that it—and the thermostat—is designed to be operated either as a manual change-over thermostat OR as an automatic change-over thermostat.

So much for the general design of room thermostats. Now to take a close look at what really makes them "tick."

SENSITIVITY

As we said, the thermostat bimetal must be sensitive to temperature changes in the room air passing it. Thus the bimetal selected for the room thermostat must have a large surface area to quickly sense slight changes in air temperature.

Also, the thermostat must be designed to provide for free passage of room air around it.

These are basics. Basic, also, are such things as:

1. *System lag*—which is the total time elapsing between the time that the thermostat senses

a temperature change and demands action by completing a circuit and the time that the controlled source of cooling or heating responds in sufficient magnitude so that the air temperature change so produced is felt back at the thermostat.

2. *Operating differential* of the thermostat—the change in room air temperature necessary to start or stop the cooling or heating source.

3. *Manual or mechanical differential* of the thermostat—the difference in movement of the temperature adjusting (or temperature setting) device necessary to cause the starting or stopping of cooling or heating.

Operating differential is of greater importance than mechanical differential because of the inherent or thermal lag of the bimetal and the heat storage capacity of the thermostat.

(To Be Continued)



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See your Anaconda Distributor for prompt, convenient, and reliable service on all of your requirements—tube, pipe, fittings, and Vibration Eliminators. The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®
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For more information about products advertised on this page use Information Center, page 59.

Builds \$1,000,000 a Year Business

Two Full Tool Sets Help Distributor Pay Close Attention to Service, Get Large Food Chain Jobs

By George M. Hanning

ST. LOUIS—Paying close attention to service and giving his customer plenty of it has built his business from a volume of \$300,000 a year to more than \$1 million a year, testifies G. J. Gruendler, Jr., president of Hussmann Distributing Co., Inc. here.

Offers Complete Engineering Job

By service, Gruendler means not only maintenance and repairs after the sale but doing a complete engineering job for the food merchant and maintaining complete facilities for making a good installation.

As an example of the type of

service he offers, Gruendler recently moved into an IGA store and remodeled it from wall to wall in only two weeks' time.

With 12 refrigeration mechanics and four carpenters on his payroll, he was able to get the work done in record time.

'Able, Willing to Cooperate'

Ability and willingness to operate in this fashion has won Gruendler installation and service work from large national food chains that normally buy these services piecemeal from several companies.

Gruendler, who has been Hussmann commercial refrigeration distributor here for eight

years, is proud that he has fully equipped his crews to make good installations. The company owns two complete sets of tools for a crew of six to 10 men and an additional half set for extra help.

The complete sets of tools used to insure a proper installation are pictured and identified here.

These pictures are used in advertising to point out to prospects that "Hussmann Distributing has facilities that can make your store modernization possible!"

Tools Stay on Job Until Completed

Such a complete complement of tools runs to considerable expense and Gruendler makes sure that none of them stray. Each set is assigned to an installation and stays right on the job site—under lock and key in a sturdy tool box—until the job is completed.

When the job foreman checks out his materials, he checks the tools right along with them. They are itemized in the standard materials form the company uses.

When a "returned materials" sheet is made out after the job is finished, the returned tools are noted one by one on it, too. Thus any missing tools are immediately noticed and steps are taken to recover or replace them.

Gruendler believes that his is the only commercial distributorship in the area that offers the customer a company-owned complete engineering and installation service. Ralph Appel, past president of the local RSES, is in charge of the store planning and engineering.

'Service Starts with Original Layouts'

"Our service starts with the original layouts," he said. "We check the architect's drawings. Then we follow through to see that the drawings are complied with."

"We mark on the drawing everything the owner wants in the new store and these items become part of his lease," he added.

Provides Service Of Supervision

Hussmann Distributing performs this supervisory service for the entire store layout, though the company sells only refrigeration equipment, shelving, check-outs, and butcher supplies.

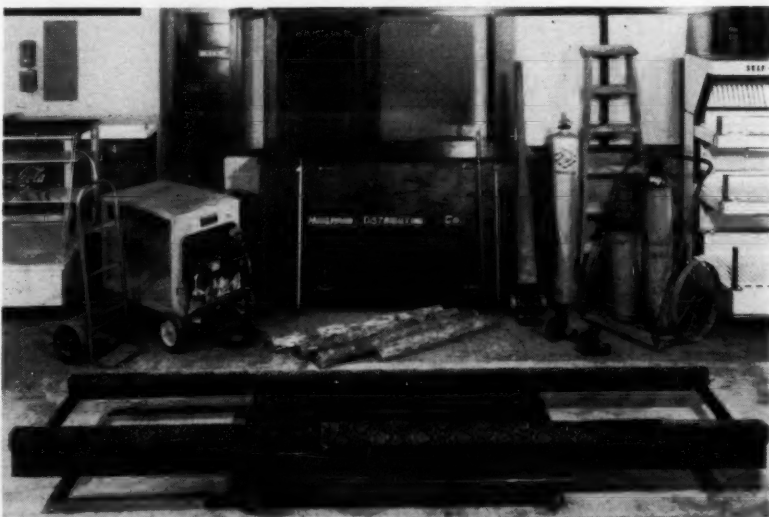
For the customer who buys his equipment, this service is part of the sale. But for those who want Gruendler to install equipment he did not sell, a fee is charged for the supervisory service.

While Hussmann Distributing makes some sales to large chains, largely on account of its recognized quality supervisory and installation work, most of its business comes from independent and cooperative stores, which are quite strong in St. Louis.

"There are four strong cooperative organizations here



TOOLS NEEDED TO MAKE a proper commercial refrigeration installation are laid out by Hussmann Distributing Co., St. Louis. The tools shown above are kept in the tool box on the job site until the installation is completed. On top of chest (l. to r.) 1/2-in. electric drill, 1/4-in. electric drill, two light meters, three guides for power driver, and tool carrier (behind power driver). Directly in front of chest are (l. to r.) pipe vise, pipe support, cutting torch with gauges and hose, electric hammer and tools, thread cutter, acetylene tips and tank, and power pipe threader. Directly ahead of these are (l. to r.) brazing torch, gauge, and hose; pipe wrenches and sledge hammer; pipe cutters; pipe threader; thread cutter; and pipe reamer. In foreground are (l. to r.) refrigerant gauges, manifold, and hose; amprobe (in black case), hand tools, chain hoist; and tube benders.



BIGGER EQUIPMENT THAT Hussmann's crews of six to 10 men take with them on a job are the portable dolly in the foreground and in the back row (l. to r.) hand truck, portable arc welder, portable tool box, wood rollers, pry bar, Johnson bar, rollers, CO2 cylinder, ladder, and refrigerant service cylinders.

and we work with all of them," salesmen. They work out of the home office to cover territories

Hussmann Distributing covers extending 75 miles east, 125 the St. Louis area with five (Concluded on next page)



Ice cream stays brick hard in Warren's new Self-contained

Strictly brick hard ice cream day and night—day in, day out—thanks to drastic subfreezing temperatures and a sure, unique defrosting system. Proved performance in tropical and high-humidity climates. A wide-open display and a more-than-generous capacity, too.

A one-shelf merchandising canopy, of the same top-quality materials and workmanship as the cabinet itself, is optional. The adjustable shelf adds impact to impulse items or even staples, and invaluable economy from this maximum use of floor space. The cabinet is genuine porcelain and the canopy, baked enamel—both finishes acid resistant and rugged. The good looks is Warren Diamond Jubilee styling. Warren COLORAMICS® bands optional at no extra cost.

There's no simpler, surer way to block-busting packages of ice cream, merchandised right, than in the new Warren Self-contained.



BOOTH 555

Warren Refrigerators

P. O. BOX 1436 ATLANTA 1, GEORGIA

EXPORT DIVISION: P. O. BOX 27884, LOS ANGELES 27, CALIFORNIA

KOCH JET forced draft COOLING TOWER

An amazingly efficient tower that combines the simplicity of natural draft towers with all the efficiency of a forced draft tower.

- * no moving parts!
- * installs easily...anywhere!
- * compact...attractive!
- * COSTS LESS!

Available sizes match all self-contained air conditioners 3 to 25 tons

Jetty says:
see me in
action at the
ARI Show*

Amazingly
simple design!
Simply
amazing performance

Inlet Diffuser / Inductor Nozzles /
Powerful Jet Action Forces Air /
500 F P M Velocity / Assures Intimate Contact with Water / Self-
Cleaning Dynamic Sprays / No Wood-Fill / 360° Glass Eliminator /
Plasticlaid Finish Top to Bottom /

The same engineering skill that has made Koch products outstanding in the basic oil industry equipment field has gone into the manufacturing of the revolutionary new Koch Jet Action Cooling Tower.

*BOOTH 328
NOV. 18-21

KOCH
ENGINEERING CO.
321 West Douglas
Wichita, Kansas

Distributor's Services--

(Concluded from preceding page) miles south, 30 miles north, and 75 miles west of the city.

The salesmen report into the office twice a day by telephone. They gather there every Friday for a sales meeting. At the sales meeting, they brush up on their equipment knowledge, go over the week's problems, and discuss company sales policies.

On the service side, it is obviously impractical to try to cover such a large territory from the home office. So Hussmann Distributing contracts with five service organizations in the outlying areas to handle the service in their territories.

The home service organization works only in St. Louis and St. Louis county and E. St. Louis, Ill. Hussmann Distributing offers 24-hour service on a time and materials basis only. It does no maintenance contract work.

"We can make money operating our service department this way. We find that the customer prefers to pay for his work when he gets it.

Sends Itemized Work Sheet

"When we invoice a customer for service work, we also send along an itemized work sheet so that he can see just what work was done. We further note on the worksheet whether the trouble was caused by the customer or whether the fault lay with the equipment.

"We believe the merchant should hear about it when he makes a mistake. We certainly do when we make one. Customers appreciate hearing about their mistakes, particularly top management of chains. They take steps to correct their errors when they see how much they cost.

Installation and service department is under the supervision of Clifford J. Gruendler, who is a past president of the local Refrigeration Service Engineers Society.

Encourages RSES Participation

Clifford Gruendler is not only active in the society, he also encourages all his men to participate. He feels that the additional information they pick up at the meetings is valuable in their every day work.

Gruendler also exerts considerable effort on his own to keep his servicemen posted on proper installation and service techniques. He invites factory service managers of the equip-

ment he handles to participate in regular service meetings.

He also takes advantage of the fact that the Hussmann factory is right here in St. Louis. Once or twice a year, he sends the installation and service men through the factory to see how the equipment is made and to factory-sponsored clinics where they learn how to install and service the latest models.

Hussmann Distributing's servicemen furnish their own cars and hand tools. The company assigns only a pick-up truck and a station wagon to the service department.

Keeps Man on 24-Hour Service

Because the company offers 24-hour service, one man is on 24-hour duty for a week at a stretch. In summer, when the company is busiest, two other men are placed on stand-by duty.

Gruendler looks upon service as an added sales tool. "A good service department goes a long way to make more sales," he said.

In fact, he confessed, he was mighty happy to have the service department this past year. Sales this year—as in many other areas—have not been up to expectations. While the company did a lot of replacement business, it installed only two major new markets this year.

In his promotion of service, Gruendler makes good use of a book on "Maintenance Tips for your Refrigeration Equipment" put out by Hussmann Refrigerator Co.

He recently circularized his customers with a letter offering a free copy of the book. To those who sent in reply cards, he sent the following letter:

"Wish to acknowledge return card requesting your free copy of 'Maintenance Tips for your Refrigeration Equipment.'"

'Benefits from Proper Care'

"Our representative will deliver to you in the next day or so the booklet and you will note the benefits that can be gained by proper care by store personnel, which are as follows:

- "1. Help incur uninterrupted performance.
- "2. Decrease product loss.
- "3. Lower cost of operation.
- "4. Increase life of equipment.
- "5. Prevent fire hazards.

"In addition to Care and Maintenance of Condensing Units, there are 25 suggestions to prolong the life of your refrigerated fixtures. You will also note several subjects,

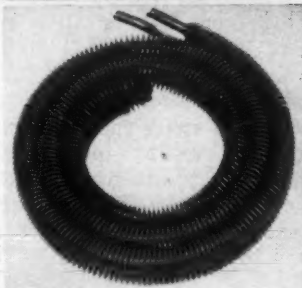
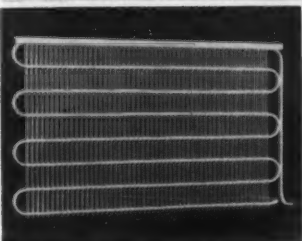
"Meat Discoloration.

"Reduce Meat Shrinkage by Proper Temperature and Humidity Control.

"Tips on Handling of meat, produce, frozen foods, and dairy products.

"If we can be of further service to you, please feel free to call on us at any time. We extend to you an invitation to stop in and look over our display of refrigerator equipment, shelving, check-out counters, and butcher supplies."

This offer and follow-up proved to be a fertile source of leads for his salesmen, Gruendler said.



PRECISION-MADE

with skill and care



Through the past 20 years Stubnitz Greene has established a reputation for quality products in the automotive field. Now, combined with Quincy Products, these two organizations bring their skill and careful craftsmanship into the manufacture of products for the refrigeration and air conditioning industry.

Your needs for quality coils, condensers, relay switches and similar products, coupled with engineering ability at low cost can be met with full satisfaction.

Write for a recommendation tailored to meet your particular requirements.

QUINCY PRODUCTS COMPANY
DIVISION OF
STUBNITZ GREENE CORPORATION
QUINCY, MICHIGAN

**They'll want to finance it,
so call in COMMERCIAL CREDIT**

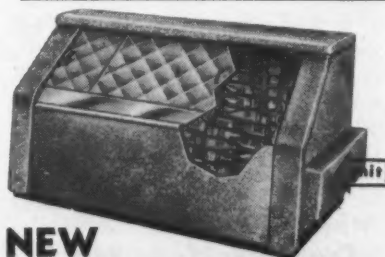


MAKE YOUR PROPOSALS COMPLETE

... most of your prospects need their cash and usual lines of credit for current operations ... make it easier for the prospect to sign on the dotted line by including financing arrangements. COMMERCIAL CREDIT'S Refrigeration Plan is backed by many years' experience, handling financing for thousands of commercial refrigeration and air conditioning installations. Let us show you how COMMERCIAL CREDIT's method functions smoothly ... saves you time and trouble. Over 300 offices assure fast service. Call our office in your city or write COMMERCIAL CREDIT CORPORATION, Commercial Credit Building, Baltimore 2, Maryland.



A service offered through subsidiaries of Commercial Credit Company, Baltimore ... Capital and Surplus over \$200,000,000 ... offices in principal cities of the United States and Canada.



NEW

17-CASE Cap. SELF-CONTAINED BEVERAGE COOLER \$250

6 or more \$235—10 or more \$225

Stainless steel doors and track. Top, front and 2 sides finished in "Multi-kolor". All radius and ball corners. Tecumseh unit, concealed coils. No interior obstructions of unit or blower. Size—54" l. x 26" w. x 39" h.

4-BROTHERS

REFRIGERATION MFG. CO., INC.
1427 S. 8th St. Phila. 47, Pa.

Refrigeration System Design for Food Markets

In the Far West, 'Racked' Hermetic Units with Closed Water System Evaporative Condenser Is a New Approach

By Gowan Dacey and George Plakos, Dacey-Plakos Corp.

Today's market operators in addition to being beset with the numerous problems of distribution, profit margins, labor relations, and general survival, must meet the competition that surrounds them and are forced to look for new and improved means of meeting these common obstacles. One prominent and certainly most important problem is their refrigeration systems.

What Is the Method Best Suited to Markets?

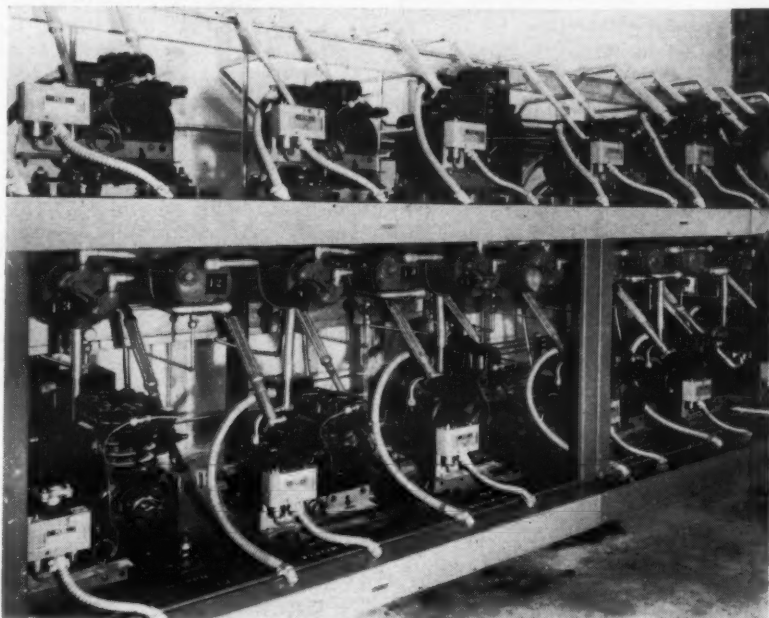
Nationwide, all manner of installations have been sold and installed. Some good ones and

many poor ones have caused general questions to be raised as to, "What is the method of refrigeration best suited to this particular and unique commercial application—the Food Market?"

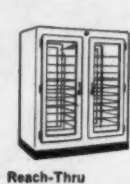
Here in the West the varied conditions of heat or cold, and the low or high wet-bulb condition have been most successfully controlled through the use of evaporative condensers, in our experience. Belt-driven compressors and motors, or hermetic motor-compressor assemblies, were mounted on racks. Each compressor discharging into an independent condenser circuit in

the evaporative condenser, the condenser circuit having been sized so as to maintain a predetermined condensing condition at "design" wet-bulb conditions.

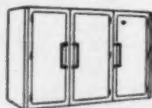
The "racked" compressor type of installation became very popular because of valuable floor space saved and also because of very definite service advantages resulting from having all compressors and motors, sight glasses, etc., in one open and accessible location. From a standpoint of space the hermetic motor-compressor assemblies had a distinct advantage over the more bulky belted compressors and motors mounted on a similar, but larger, rack.



CLOSE-UP of the hermetic refrigeration compressor rack at the Market Basket food market in Covina, Calif., showing compact arrangement of water-jacketed compressors and the shell-and-tube condensers, which have individual water valves to maintain proper head pressures in any ambient. On the rack, at the base of each unit, is stenciled in the name and location of each refrigerated fixture or enclosure which the particular unit serves. Each condenser carries an identifying number.



Reach-Thru



Sectional Storage Freezers



Frozen Food Cases



Service Cases

Outstanding merchandisers keep on going TYLER

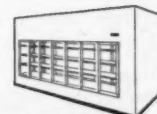
—for profitable merchandising—
efficient refrigeration—
low cost operation!

The Big Tyler Line—which offers complete food refrigeration equipment for both sales area and backroom—enjoys unusual acceptance among shrewd equipment buyers. Tyler represents the best value for your customer's investment... with very latest convenience features... lower operating and maintenance costs... Tyler-Ketcham Color Compatibility System for profitable use of color in the store... other Advanced Design features that defeat costly obsolescence. Get all the details now!

VISIT THE TYLER EXHIBIT AT
THE ARI SHOW—BOOTHS 256-318



Slide-Door



Self-Service Walk-Ins



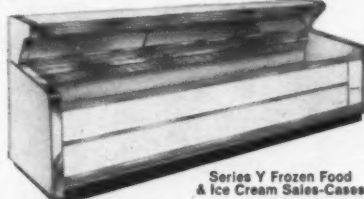
Series Y Meat Sales-Cases



Rolling-Cold Packaging Conveyors



Self-contained Walk-In Freezers



Series Y Frozen Food & Ice Cream Sales-Cases



Beverage Coolers



Condensing Unit Assemblies



Series Y Adjustable-Shelf Dairy Sales-Cases



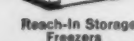
Reach-In



Series Y Produce Sales-Cases



Walk-In Storage Freezers and Coolers



Reach-In Storage Freezers



Series Y Multiple-Shelf Sales-Cases



Refrigerated Tables



Series Y Super-capacity Meat & Dairy Sales-Cases



Super Air-Cooled Vertical 2-some



Super Air-Cooled Vertical 3-some

Also available in single units. Plus complete line Water-Cooled Multiple Assemblies

TYLER

PIONEER of important improvements

TYLER REFRIGERATION CORPORATION, Niles, Mich.
Canada: Tyler Refrigerators, 732 Spadina Avenue, Toronto, Ontario. (Export: Tyler Refrigeration International, C.A., Apartado Postal 9262, Caracas, Venezuela, S. Amer.)

MOVE
AHEAD
WITH
TYLER!

Send coupon today for complete information

Tyler Refrigeration Corporation, Dept. AR-11 Niles, Michigan
Rush latest data on new Tyler ☐ Sales-Cases (Series Y) ☐ Rolling-Cold Packaging Conveyors ☐ Walk-In Coolers ☐ Storage Freezers ☐ Reach-In and Reach-Thru Refrigerators ☐ Service Cases ☐ Condensing Unit Assemblies ☐ Airline Shelving ☐ Tyler-Ketcham Color System ☐ Store Planning.

NAME _____

ADDRESS _____

Get Working Units From Under Shelves

Getting these working parts out from under shelves, or other confined areas, together with the use of hermetic motor-compressor assemblies (power units) has effectively eliminated all fire hazard from this source.

A bench assembled "rack" of hermetic power units discharging into a remote air-cooled condenser or an evaporative condenser seemed to be most practical for the supermarket installation with its exacting demands for high and low temperature cases, controlled humidities for perishable foods, and ultra low temperatures in the frozen food and ice cream cases.

'Equipment Undersized'

But, because of the natural tendency to sometimes underestimate extreme high ambient conditions, as well as succumbing to the human element of remaining competitive, it is constantly evident that some disservice is being rendered the customer by undersizing the equipment—resulting in a below par performance record during high temperature periods. This is particularly true in the case of air-cooled condensers during periods of high outside temperature.

It has, therefore, become apparent to many users that a combination of "racked" hermetic power units in combination with a multi-circuited evaporative condenser best resolves the problem.

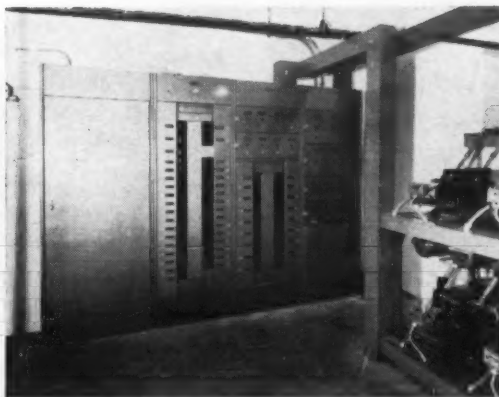
'Why Evaporative Condenser Works Best'

First, from the performance standpoint, water, yet, produces the highest degree of condensing efficiency resulting in a more critical control of condensing conditions and fixture temperatures within the market which is the ultimate and most primary consideration of the operator.

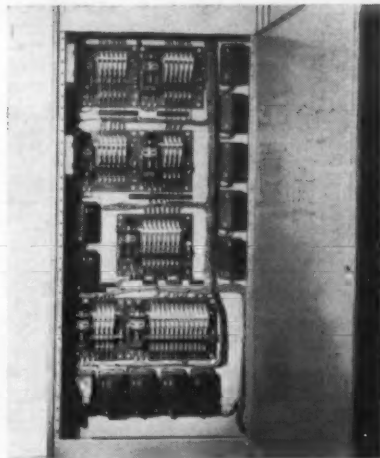
(Continued on next page)



A SINGLE-CIRCUIT Recold DFC-20 evaporative condenser, operating with a closed water system, provides all the necessary condenser cooling effect for the bank of compressors in the Market Basket installation made by Dacey-Plakos Corp.



COMPLETELY pre-wired control panel in the equipment room makes handling and servicing of electrical control problems a simple matter.



VIEW OF section of control panel with door open, revealing neatness of pre-wiring job.

Refrigeration System Design --

(Continued from preceding page)

Secondly, a tremendous saving in the appropriation of valuable and expensive warehouse space can be shown with this type of installation. For a 100-hp. (20 unit) installation, as little as 100 sq. ft. may be adequate under the most favorable conditions.

A third, and very important consideration is that of system maintenance costs. Because evaporative condensers can and will control condensing conditions at a predetermined maximum pressure the system performance is constant and the over-all maintenance costs reduced. Some additional condenser maintenance costs are quite apparent but these are more than offset by lack of compressor and other system difficulties.

Hermetic power units are now available with fans to cool the motor/compressor assemblies and perform well on systems calling for temperatures in the commercial range. However, for the -20° to -50° evaporating conditions required in frozen food and ice cream cases, it is necessary to water cool the motor jackets in order to control the compressor discharge temperatures. This, of course, kept the problem of fouling these water jackets with scale ever present. The importance of evaporative condenser cleanliness and treatment could not be overlooked.

Uses Condenser With Spare Capacity

When sizing an evaporative condenser, for several compressors, very often the total condenser capacity would not accurately match the compressor loads. In such cases a condenser with spare capacity was chosen and the extra capacity used to provide one or two extra circuits for additional compressors that, no doubt, would be needed as the market's business expanded.

This procedure proved of so much value to the market operator that it has become common practice to purposely select an oversized condenser with, in some instances, as many as four or five unused circuits ready for additional compressors.

Even with the success of this type of system there were still three problems that did not easily resolve themselves.

3 Unresolved Problems

1) Scale deposits on the tube bundle and in the water jackets requiring control of the water conditions.

2) Sizing each condenser circuit to accurately match the compressor load. Manufacturers of evaporative condensers could

supply circuits down to 1/2 row which satisfactorily solved this problem—but, of course, at extra circuiting cost.

3) In sizing the unused circuits intended for expansion it became a "guessing game" as to the size or capacity of extra circuits that might be needed.

A "closed water system" has been successfully developed and has proven over a period of

several years to be a great improvement in the use of the evaporative condenser-hermetic type of system. It has removed the last vestige of scale difficulties both on the condenser tubes and in the water jackets. Areas heretofore thought of as impossible and impracticable for water-cooled installations lend themselves perfectly to this type of system.

The system consists of a single circuit evaporative condenser with cooling water circulating through the tube bundle and being forced through the

(Concluded on next page)

Steer for Space Headquarters at the ARI Show!

SEE HOW
York's futuristic new line will conquer air conditioning and refrigeration space problems in 1958!

**Booth 643-646 is the place...
Nov. 18-20th the time...BE THERE!**

Find out how York in '58 takes command of the air conditioning market with new, revolutionary room conditioners that take up less space in the window...new residential and commercial air conditioners that meet the special space problems of every size and type of building...new ice makers that take up far less space on your customers' floor. And, don't miss seeing the first really new innovation in condensing units since the introduction of the hermetic condenser!

**LEARN HOW
YORK IN '58 WILL:**

Dominate Magazine Space
with a full schedule of hard-hitting national ads!

Overpower Newspaper Space
with complete, power-packed "packages" of co-op and factory ads!

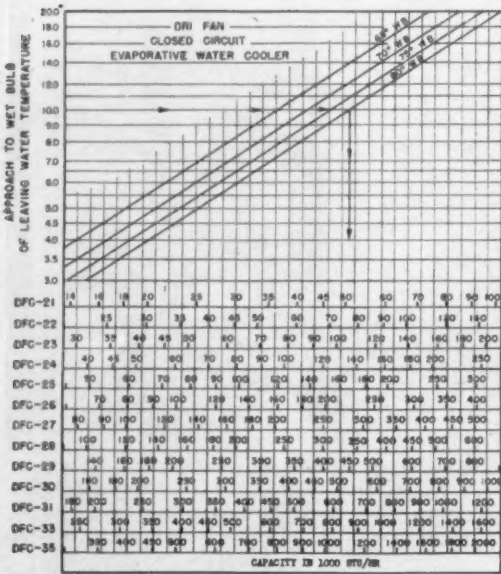
Take Over Display Space
with compelling new display pieces, brilliant new merchandising ideas!

Come on in and let us prove—
your FUTURE and FORTUNE
now lies with York!

YORK



YORK CORPORATION, YORK, PA., Subsidiary of Borg-Warner Corporation



SPECIAL SELECTION chart for use in selection of evaporative condenser in application making use of a closed water circuit.



LOW TEMPERATURE walk-in storage refrigerator in Market Basket used a Recold water defrost coil.



A DAIRY reach-in refrigerator (with storage space also) uses a "Supreme" model coil which discharges a full 360° pattern.



THIS COMBINATION walk-in reach-in beverage refrigerator uses a Delta (triangle) unit cooler installed in a corner.

New Food Market Approach--

(Concluded from preceding page) of the compressor rack. Balancing valves are placed in the water outlet of each condenser to assure equal pressure drop. When the closed water circuit has been completely charged and purged it is sealed

and the same water is recirculated over and over.

Scale, Algae Cut Out

Because no make-up water is added to this closed system, any build up of scale or algae is completely eliminated.

The function of the evaporative condenser now is to cool this circulating water as it passes through the tube bundle. The water returning from the condenser is never over 95° F., so the surface temperature of the tube bundle is considerably below that at which scale is formed. The net result of this type of system, in respect to cooling water circulation, is that no scale is formed in either the condenser or water jackets nor on the tube bundle.

Selecting an evaporative condenser for this type of system requires a different approach than that used in selection for the customary evaporative condenser application. Recold Corp., a manufacturer of heat exchange equipment, has prepared an excellent chart making this selection extremely simple. A copy of this selection chart is illustrated. An accompanying tables provides a method of determining water head losses.

Overcomes Difficulty of Sizing Each Circuit

This type of system overcomes the difficulty of sizing each circuit for its particular compressor and eliminates the necessity of guessing as to the size of additional compressors that might be added. The evaporative condenser takes care of each compressor according to its particular capacity up to the total capacity of the condenser. Accordingly, this system satisfactorily resolves all of the three points previously mentioned.

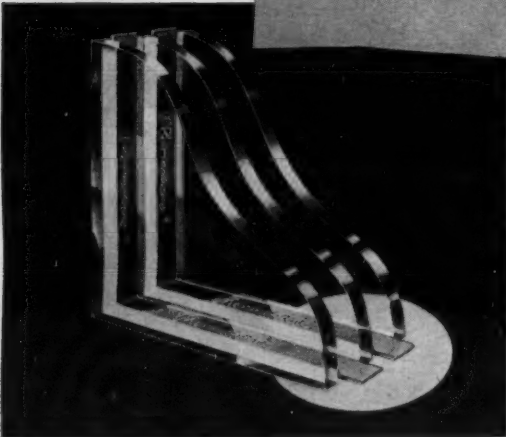
Although the initial cost of such a system is slightly higher than the multi-circuit evaporative condenser system it provides savings in maintenance expenses that amortize this cost during the first year of operation.

Lower Maintenance Costs Over 2 Years

Reduction in maintenance costs with this type of system, over a two-year period on a 100-hp. installation, have shown costs down to .10 per hp. per month, whereas these costs have been as high as .75 per hp. per month or a net saving of as much as \$65.00 per month.

Where space, performance, economy, and low maintenance cost become important factors (and where is this not true today), this type of system includes most of the answers.

ONLY THERMOPANE® has a metal-to-glass seal



moisture and dirt can't penetrate

Thermopane insulating glass has the famous, patented Bondermetic Seal®. It's a metal-to-glass seal which prevents condensation between the panes of glass . . . keeps moisture and dirt out. And there's NO ORGANIC SEALING MATERIAL! Look for the name *Thermopane* on the seal between the panes.

LIBBEY·OWENS·FORD

gives you a 5-year warranty

More than 7,000,000 units warranted to date. So accept no substitutes. For your own protection, insist on *Thermopane*.

AND THERMOPANE

keeps frozen food "in the clear"!

Customers see their favorite brands faster

(and from farther away)

through this glass . . . that stays clear!

Thermopane
INSULATING GLASS

LIBBEY·OWENS·FORD GLASS COMPANY
608 MADISON AVENUE, TOLEDO 3, OHIO



Contractor's Turntable Puts Data at Fingertips; Has Call Slips, Service Records In Proper Spot

By George M. Hanning

ALEXANDRIA, Va. — Tired of hunting through files and sheafs of papers to find information he needs while on the telephone, Harold Logan, of Logan Bros., Inc., electrical and refrigeration contractor here, cooked up a turntable file that puts everything at his fingertips.

AUTO WHEEL, AXLE IS BASIC UNIT

An old automobile wheel and axle gave him the basic turntable. Wooden end sections top and bottom support 6-ft.-long planks that form a seven-sided column.

A duct man fastened a series of some 20 V-shaped tin slots, over the length of each plank. About one third of these slots are concentrated toward the top and the remainder toward the bottom, leaving the center clear.

The slots at the top of the turntable are for the firm's electrical contracting activities. Those at the bottom pertain to the refrigeration side of the business.

The open area in the center provides room for thumbtacking notes, memos, and urgent calls.

In the refrigeration section, there are slots for each serviceman. All call slips, service records, and other information

for him are put into his slots.

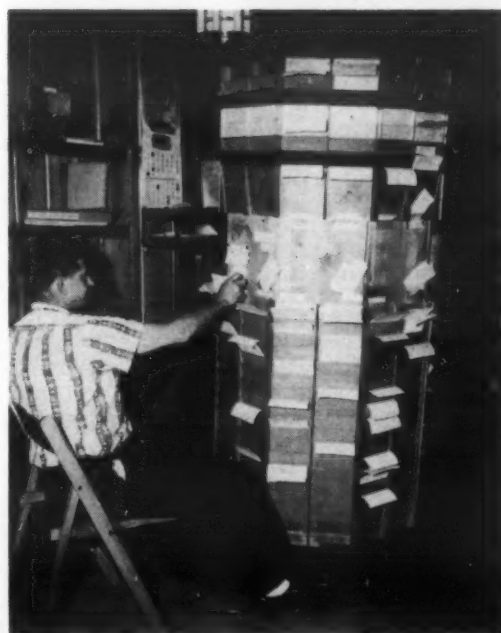
There are also separately labeled slots for parts on order, parts in, work in shop, customer will call, delivery, and installation.

REMAINS IN SEAT

As the turntable stands next to the telephone, all Logan has to do is reach out his hand, give the rack a spin to the right row of slots, and pull out the paper he wants. He no longer needs to leave his seat or break his conversation with the customer or serviceman.

The rack also helps Harold and his brother Earlih keep incoming calls assigned in rotation. Too, it keeps emergency call requests in a conspicuous

TALKING TO A CUSTOMER on the telephone, Harold Logan, Alexandria, Va. refrigeration contractor, does not have to leave his seat or break his conversation to get any records needed. The homemade filing turntable keeps everything at his fingertips.



spot where they cannot be overlooked.

The homemade rack saves a lot of time over the old filing method, Logan observed. Of course, conventional filing is used for permanent and inactive records.

Plugs Ice Cream Sales

Resets Self-Serve Cases In Store's Center Front

DENVER — Disappointed in the amount of ice cream sold in his residential area, Andy Andrews, manager of the Republic Drug store in suburban University Hills Plaza, tried an experiment.

He moved his two self-service ice cream cases from their wall location and relocated them in the center front of the store where customers couldn't miss them.

Then he built hardwood finish superstructures to bridge the two cases. Large signs on top of the superstructures urged customers to help themselves to the 28 varieties of ice cream in the cases and pay the cashier.

On the center shelf he displayed related items to go with the ice cream.



I'm Happy!

WITH OUR McCRAY EQUIPMENT

...AND SO ARE OUR CUSTOMERS



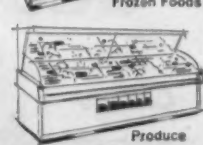
SHOW MORE
Greater Display Areas
SELL MORE
Greater Capacities per foot
in McCray D A S Cases

"Business is up and so's our profit since we installed McCray cases. Easier shopping features please our customers—and carts roll up to the registers with bigger loads than ever! And McCray refrigeration works... dependably. Service costs and spoilage are cut to the bone."

From all over the nation, where McCray food merchandising cases are being installed, come happy expressions like this. McCray distributors are cashing in on the rapidly increasing demand for McCray features by volume merchandisers. Some territory is available to aggressive distributors who are prepared to capitalize on this opportunity. If your area is open we'll gladly supply complete information about the McCray franchise— inquire now.

McCray Refrigerator Co., Inc., 1101 McCray Ct., Kendallville, Indiana

McCray Models
to Meet Every
Refrigeration Need
in Food Stores



McCray

Designed to **SELL MORE** • Engineered to **SAVE MORE**

For more information about products advertised on this page use Information Center, page 59.

What's New



Room Thermostat Has Straight-Line Style

—KEY NO. G-1130—

MORRISON, Ill.—A new room thermostat with contemporary straight-line appliance styling, has been announced by the General Electric Co.'s Appliance Control Dept. for domestic heating and air conditioning systems.

Squared to blend with straight-line design requirements in today's homes, the new thermostat features bold-face temperature readings that are visible from across an average-size room.

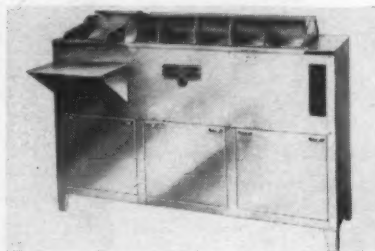
Automatic Deep Fat Fryer Offered In 2 Models

—KEY NO. G-1131—

HUDSON, N. Y.—"Unifryer," an automatic deep fat fryer, manufactured by the Gifford-Wood Co. is available in two models.

Model 18 is for general restaurant use. Heavy-duty model 27 is for mass feeding operations such as institutions and industrial plants.

Unifryer has a fat container about 50 in. long. A screw conveyor gently carries the food



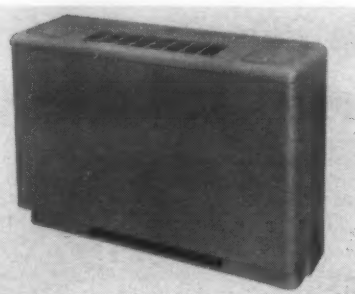
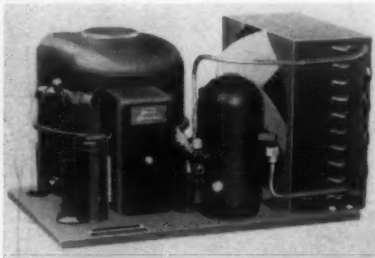
through the fat until it is properly cooked.

Develops 1/2-Hp. Air Cooled Condensing Units

—KEY NO. G-1132—

EVANSVILLE, Ind.—Model BRH45 is an economy, air-cooled, 1/2-hp. condensing unit made by Bendix-Westinghouse Air Brake Co., Evansville Div.

It is compactly designed and suited for those applications involving evaporator temperatures up to 40° F., where full 1/2-hp. capacity is not required, but greater than 1/4-hp. capacity is desirable.



Introduces Year-Round Room Conditioner

—KEY NO. G-1133—

W. HARTFORD, Conn.—Dunham-Bush, Inc. has introduced a new "CR" year-round room air conditioning unit which features variety in choice of construction, in selection of units, and in manner of installation.

New CR is available in several styles, including cabinet or recessed models, vertical or horizontal models, with combination cooling and heating coils.



Condensate Disposal Pump Rings Alarm

—KEY NO. G-1134—

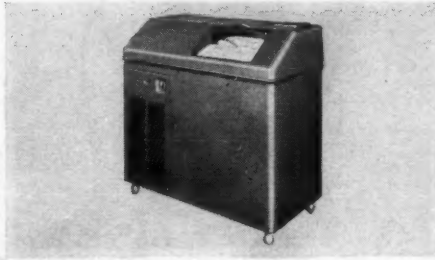
SPRINGFIELD GARDENS, N. Y.—Latest Kesco condensate water disposal pump for air conditioners, featuring a "flood control" which will shut off the air conditioner and ring an alarm should the water reach a dangerous height has been introduced by Kesco Products Corp.

This new 20-ft. head pump, available in 110 and 220 v., measures 9 in. high, 6 in. deep, and 12 in. wide. The large reservoir was designed to handle the condensate of a 5, 10, or 15-ton air conditioner and the waste water of electric water coolers.

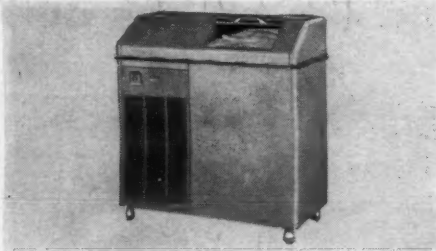
See the Complete Scotsman Ice Machine Line Booths 747-749 at the "All Industry" Show



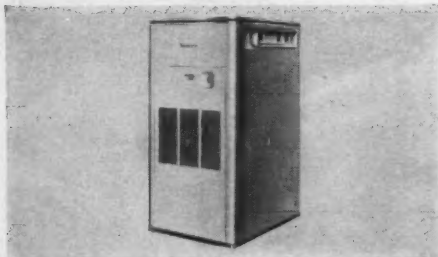
While you're at the A.R.I. show in Chicago, November 18-21, be sure to drop in at the Scotsman exhibit in Booths 747-749 at the Amphitheater. See the hottest line of ice machines in the industry!



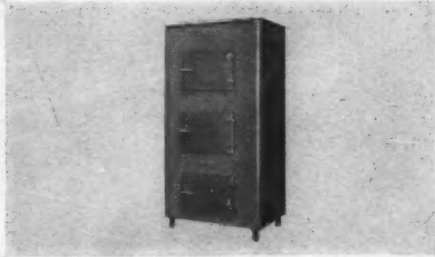
America's Most Specified Line of Ice Machines!



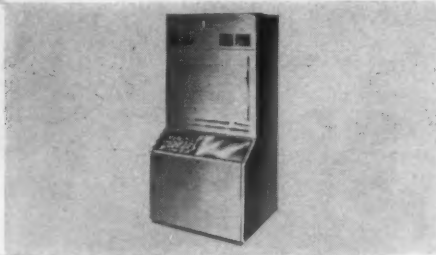
More Than 40 Machines for You to Sell!



Models for Every Prospect, Big or Small!



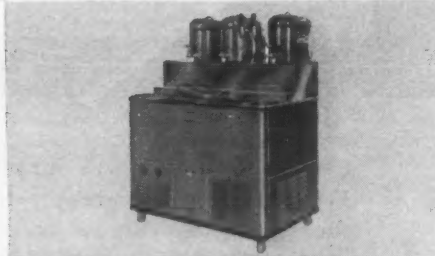
Scotsman Dealers Are Making More Money!



Cash in with Scotsman, the Industry Leader!



Send in the Coupon Your Ticket to Profits!



Yes! Send me complete information about a dealer franchise for Scotsman Ice Machines.

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Mail to: American Gas Machine Co., Division Queen Stove Works, Inc., 2011 Front Street, Albert Lea, Minnesota

Adds 3 Gas-Fired Furnaces to Line

—KEY NO. G-1135—

WICHITA, Kan.—Three additions to its "Trim-Boy" line of gas-fired warm air furnaces have been announced by the Coleman Co., Inc.

Largest of the three is a 165,000 B.t.u. upflow model. Both upflow and downflow types are offered in new models rated at 135,000 B.t.u.

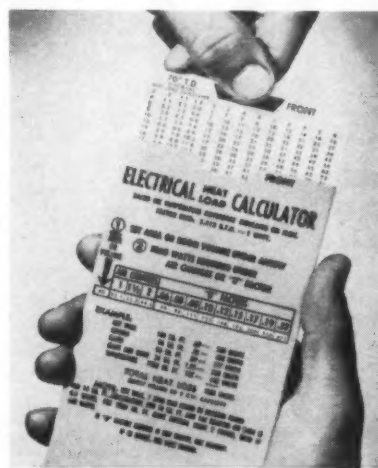
The new models are equipped with slotted head burners which tailor the flame to the combustion chamber; heavy-duty heat exchangers; fan and limit controls, thermo safety pilot and pressure regulator. Flue outlets are front located to save floor space and simplify venting.

Heat Transfer Has 4-Pass Counterflow

—KEY NO. G-1136—

DES MOINES, Iowa—A four-pass counterflow heat transfer is featured in a new line of industrial heaters developed by Lennox Industries, Inc.

The transfer is accomplished without the use of internal baffles. The primary heat transfer surface is constructed of heat-resistant stainless steel, eliminating the refractory lining and its periodic replacement. This permits the unit to be mounted on the floor or suspended from the ceiling, the company said.

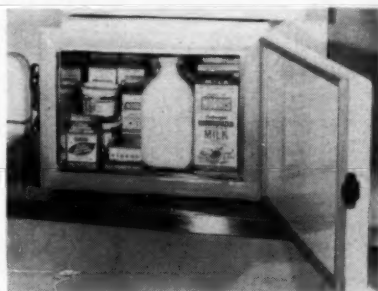


Instant-Reading Calculators Offered

KEY NO. G-1137
KALAMAZOO, Mich.—Two inexpensive new instant-reading calculators are being marketed by Paul S. Morton Engineering Service here.

The "Payroll Tax Calculator" is claimed to give 100% accurate readings of withholding tax and the new 2 1/4% F.I.C.A. tax automatically without a pencil.

An electrical heat-load calculator is also claimed to give 100% accurate readings of heat loss in watts, making it possible to select proper heating unit required for a given space instantly.

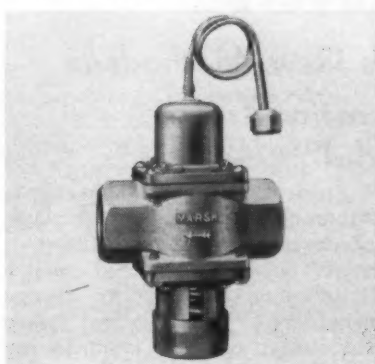


KEY NO. G-1138
INTERIOR view of the new Norris Dispensers, Inc. "Cold-Bar" refrigerated milk and dairy products storage cabinet is shown. Designed to fit on kitchen countertops under wall cabinets, this unit releases space in over-crowded refrigerators. It is being manufactured in two sizes; the smaller size holding six 1/2-gal. bottles, the larger size holding nine.

Has 1-In. Pressure-Actuated Regulating Valve

KEY NO. G-1139
SKOKIE, Ill.—A new 1-in. pressure-actuated condensing water regulating valve has been added to the line of regulating valves manufactured by the Jas. P. Marsh Corp.

Latest addition to the No. 56 series, the valve is designed with a wide continuous adjustment range, 60 lbs. to 270 lbs. p.s.i. This permits the use of this one valve on either Refrigerant-12 or 22 systems as well as all other common refrigerants except ammonia. The type 56 is now manufactured in 3/8, 1/2, 3/4, and 1-in. sizes.



Sealant Bars Damage

KEY NO. G-11311
HARTFORD, Conn.—"Loctite" is a new sealant introduced by American Sealants Co. which is claimed to prevent damage, loss of temper, big service bills.

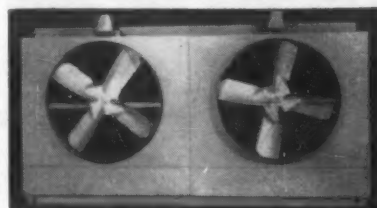
Loctite is easy to apply. It is a thin liquid that wicks in between 2 1/4, 3 1/4, 5, 6, or 8-in. sizes of ducts.

Cooling Towers Feature Twin Fans

KEY NO. G-11312
PITTSBURGH—Twin fans are featured in the new, "extra-quiet" 80 and 100-ton cooling towers introduced by Halstead & Mitchell.

Making use of large diameter, four-bladed, deep pitch fans, these cooling towers are belt-driven at low speeds by special weather and splash-proof motors to give a new low in cooling tower noise.

Included is Halstead & Mitchell's 20-year guarantee on its wetted deck surfaces against rotting or

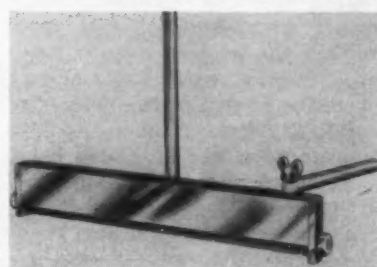


damage due to fungus attack and increased corrosion resistance due to rugged 14-gauge steel cabinets weatherized by applications of vinsynite, vinyl zinc, and rubber.

Hand Folder Turns Drive Cleats on Ducts

KEY NO. G-11313
E. LONGMEADOW, Mass.—A rugged hand folder designed to turn drive cleat folds on sheet metal duct or fittings has been announced by Duc-Pac, Inc.

The folder is made of cadmium plated steel and is designed to fold either 1/4 or 1/2 in. folds on 2 1/4, 3 1/4, 5, 6, or 8-in. sizes of ducts.



Chipboard Grille Work Featured In Filter

KEY NO. G-11310
PITTSBURGH—A new glass fiber air filter utilizing diecut chipboard grille-work rather than metal stampings, has been announced by Fiber Glass Div., Pittsburgh Plate Glass Co.

To be known as the "Glasfloss Safety-Grille" filter, the new product is said to be useful for industrial applications because of its safety advantage. The elimination of metal grille-work in its design prevents hand and wrist cuts from broken metal.

New filter is stronger with two diecut sections of chipboard (top and bottom) with the ends firmly fastened to make a single unit.

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ON KNOWING A GOOD THING
WHEN YOU SEE IT?**

REFRIGERATION MEN ARE WELCOMING TMC MOLECULAR SIEVE FILTER-DRIERS WITH OPEN ARMS... and HERE ARE THE REASONS

Tube Manifold Engineers saw the advantages of LINDE Molecular Sieves over 4 years ago. They tested . . . they designed . . . they proved the radically improved drying and filtering ability of TMC Molecular Sieve Filter-Driers.

And now they are being approved throughout the air conditioning and refrigeration industry.

- BECAUSE they are up to 19 times as efficient.
- BECAUSE they are 10 times as small. Only 4 sizes handle 1/4 to 15 tons.
- BECAUSE they are not affected by oil and high working temperatures.
- BECAUSE they save space for manufacturers, wholesalers, installation and service contractors.
- BECAUSE above all, they save on first cost and maintenance costs.

Send for Questions and Answers Folder about these radically new TMC Molecular Sieve Filter-Driers made by America's largest manufacturer of liquid receivers.

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For more information on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

Products Advertised
(list name, page, and issue date)

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Factors in Selecting Scale Removers

Study Among Servicemen Reveals New Methods In Scale Remover Use, Service Operation Trends

The Grasselli Chemical Dept. of the du Pont company recently conducted a survey among air conditioning servicemen to determine what factors are involved in the choice and use of scale removers. The results of the survey and Grasselli's interpretation of the findings follow.

Not so long ago the words "scale remover" were synonymous with hydrochloric acid. Within the past five years, however, another entry has made its presence known in the field—the solid, dry acid cleaner, usually containing a sulfamic acid base.

To determine the industry's attitude toward these newcomers, the Grasselli Chemical Dept. conducted a survey among air conditioning servicemen.

Question by question, here is the story told by 1,400 replies—perhaps including your own.

Question No. 1—What factors do you consider most important in a scale remover?

Rapidity of action	35%
Low corrosion rate.....	32%
Ability to add direct to system	17%
Safety in handling	11%
Convenience of package....	3%

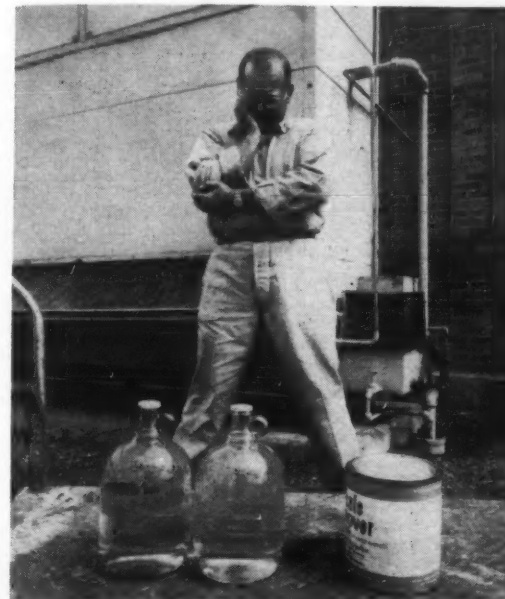
Cost 2%

Since these preferences presumably determine which type of descaling product is used, it might be wise to look at them a little more closely. All things considered, they reflect very favorably on air conditioning servicemen as a group.

While the largest percentage are most concerned with a product that offers rapidity of action—getting the job done quickly—almost an equally high number emphasize protecting their customers' equipment.

In addition, it is significant to note that the initial cost of a scale remover was considered least important of all.

This indicates that servicemen



OLD STANDBY OR NEWCOMER? Survey reveals that while hydrochloric acid has been in longtime use by air conditioning and refrigeration servicemen for their descaling jobs, many have switched to the dry, sulfamic acid based cleaners which surveys indicate now are used in nearly 50% of such operations.



"Ah knows it's important, suh! Ah knows the whole durn nation should know about it! But 'jes the same, you tell that advertisin' man o' yourn to get right back heah and . . ."

Look for us at the ARI Exposition Booth No. 258



Expect the BEST brass and copper products from

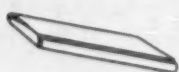
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Know-how that comes from long experience is worth telling about. As the industry has grown, as new and better ways were developed, H & H has always been in the forefront, helping set the pace. To all of the other members of the air conditioning and refrigeration industry, our partners in 27 years of progress, we offer our congratulations and thanks.

are more interested in doing a good job than in trying to save a few pennies at their customers' expense.

Question No. 2—How do you rate solid versus liquid scale removers?

(Question covered handling convenience, safety, corrosiveness, cost, and effectiveness.)

Solid scale removers as easier to handle.....	80%
Solid scale removers as safer to use	73%
Solid scale removers as less corrosive	67%
Solid scale removers as less expensive to use.....	51%
Solid scale removers as more effective	44%

It appears that while liquid scale removers won out by a slight margin on effectiveness (translated as rapidity of action), the solid cleaners lead in all other categories.

Question No. 3—To what extent are you using solid scale removers?

78% are using solid scale removers to some extent.

54% are using more than three times as much solid as liquid scale remover.

Considering the fact that the first dry solid scale remover was introduced just about five years ago, these figures are indicative of a truly rapid acceptance.

Two other questions were asked that show an opportunity and a need for educating users of air conditioning. They were:

Question No. 4—Are commercial users of air conditioning equipment aware of the importance of periodic scale removal?

No—53% (14% indicated that most of their calls came only when an actual breakdown occurred).

Question No. 5—How many commercial users are on regular service contracts?

30% are on regular service contracts.

Almost everyone is familiar with hydrochloric acid and its characteristics; and, since almost all solid scale removers are sulfamic-acid-based compounds, it might be wise to become equally familiar with this relatively new commercial chemical. Perhaps a good way of doing this is to measure it against the six considerations mentioned in Question No. 1.

(Concluded on next page)

Corrosion Data Solution at 70° F.

(Values expressed in 10-thousandths of an inch penetration per month)

Metal	Hydrochloric Acid, 3% HCl	Sulfamic Acid		Ratio of Corrosion (3% HCl—6% Sulfamic)
		3%	6%	
Bronze	14	2.0	1.9	7.4
Copper	14	2.1	1.8	7.8
Aluminum	90	17.0	5.0	18.0
Brass	6	2.1	2.0	3.0
Mild Steel	80	19.0	23.0	3.5
Galvanized Iron	Very rapid corrosion	Rapid corrosion but slower than with hydrochloric		

Service Survey--

(Concluded from preceding page)

A. Rapidity of action—While slightly more than half (56%) of the replies favored liquid scale removers, the closeness of the decision shows this to be a very questionable area. A look at the chemistry involved in scale removal shows why.

The length of time required for a given amount of hard water scale to dissolve completely in hydrochloric or sulfamic acid will depend on the concentration and temperature of the acid solution.

As either one of these variables increases, the more rapid the reaction with scale will be. For instance, doubling the strength of sulfamic acid from 2% to 4% will quadruple the room temperature reaction rate; increasing the temperature of a 2% solution from 77° F. to 100° F. triples the reaction rate.

As for the acids themselves, under similar circumstances chemically equivalent amounts of either acid (about 10 lbs. of sulfamic-based product for every 1 3/4 gals. of hydrochloric-based product) will dissolve the same amount of scale as the other. By the same token, a heavier concentration of either acid will outperform a weaker solution of the other.

So, with honors even, there is no wonder some difference of opinion exists on this subject.

B. Low corrosion rate—Metals are subject to acid attack to varying degrees, depending upon the type of metal involved; the type, concentration, and temperature of the acid; and the presence of other elements which may either accelerate or inhibit this acid attack.

All commercially available scale removers for air conditioning and refrigeration systems contain inhibitors which serve to greatly reduce corrosion. Attack on mild steel, for instance, is generally reduced by 95% or better through the addition of inhibitors.

While the following chart shows the relative corrosive characteristics of uninhibited hydrochloric and sulfamic acids, the same relationship persists after inhibitors have been added.

Disregarding galvanized iron, it can be seen from the fourth column that hydrochloric acid is from three to 18 times more corrosive on air conditioning metals than sulfamic acid. These figures do not include possible corrosion effects from hydrochloric acid fumes.

One of the most noticeable differences between the two acids is the fact that sulfamic acid gives off no fumes whatever.

C. Ability to add direct to system—17% of the survey replies mentioned this as the most important consideration in selecting a scale remover.

A breakdown showed that 48% use this method all of the time, while about 80% have used it at least once. Proponents of this method voiced major objections to the time and difficulties involved in breaking a joint and pumping from a bucket.

Actually, both hydrochloric and sulfamic acids can be used in this manner, although sulfamic-based products have the

advantage of a lower corrosion rate on the metals present in the spray tower.

D. Safety in handling—This again would go to the sulfamic-based cleaners by a wide margin with their freedom from the hazards of bottle breakage, liquid spillage, and acid fumes. Hydrochloric acid can cause severe burns whereas the chances of such an injury from accidental contact of dry sulfamic acid and dry skin are pretty slim.

E. Convenience of package—Basically, this is tied in with the "safety in handling" factor. It matches disposable lightweight cans or fiber drums of the sulfamic-based product against the glass containers of hydrochloric acid. The former were preferred.

F. Cost—Here we find something of a paradox. While most sulfamic-acid-based cleaners have a somewhat higher initial cost than the hydrochloric cleaners,

a majority of the servicemen stated that sulfamic-acid-based compounds "cost less to use."

Probably their reasoning behind this statement is based on the ease of handling and other use advantages of sulfamic acid compounds. A closer look at the materials costs themselves is worthwhile. This can best be done by comparing a gallon of hydrochloric acid with a 10-lb. drum of sulfamic-acid-based cleaner, the closest comparable package in weight of contents.

A 1-gal. container of the most concentrated hydrochloric acid that can be feasibly handled and used for this purpose contains only 23% by weight, or 2.1 lbs., of actual working acid. In some products the concentration of this corrosive acid is limited to 15% by weight.

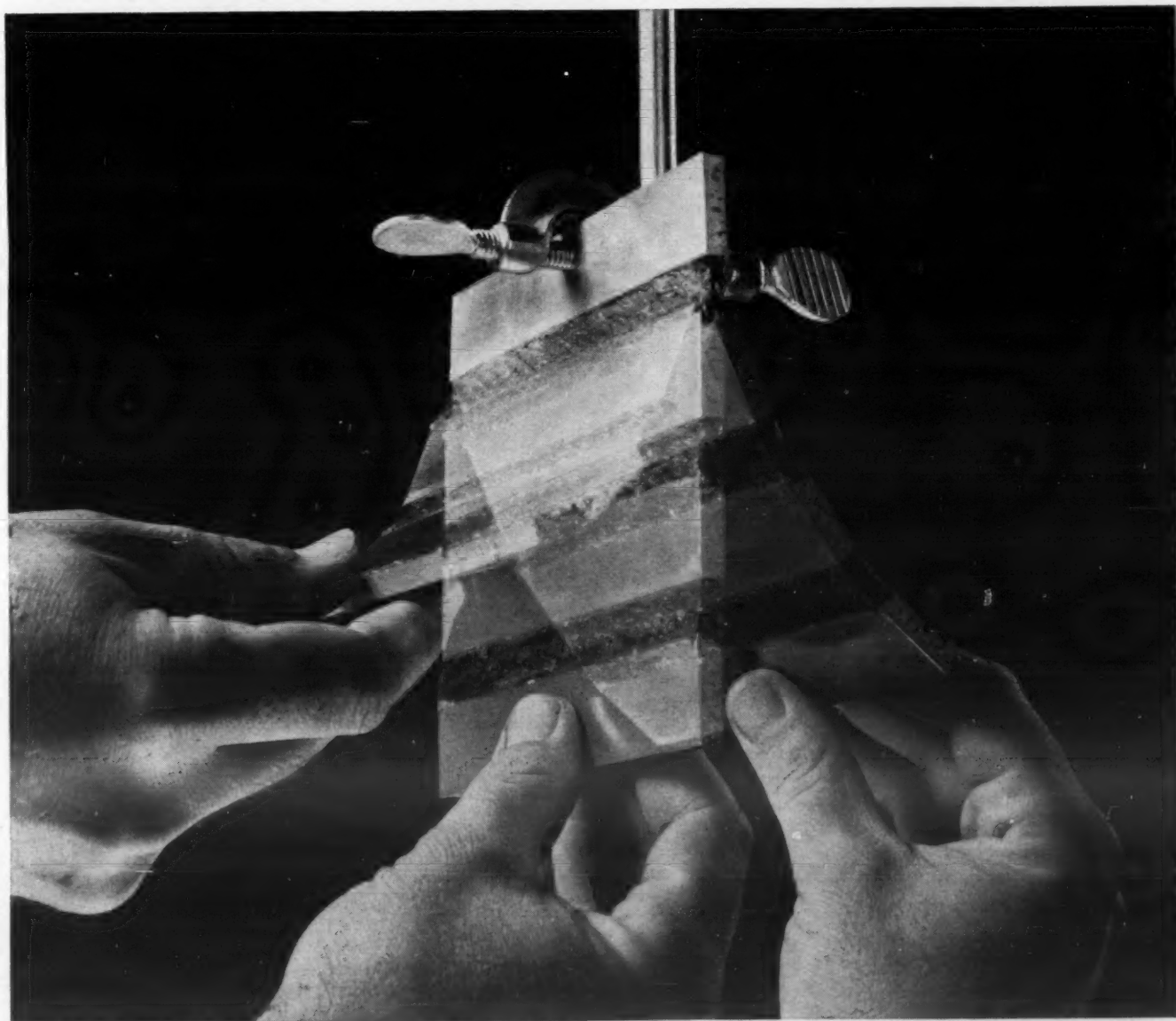
On the other hand, sulfamic acid being a non-fuming, dry acid does not require dilution with water and, therefore, is

practically 100% working acid. This is better than 4 1/2 times as much as in the most concentrated of the liquid removers.

Therefore, it is obvious that the higher unit price of the dry acid cleaner, that is, generally about 2 1/2 times that of the liquid cleaner, can be misleading.

While no completely accurate statistics exist concerning the percentage of either type cleaner used, it is generally felt that the new dry acid compounds enjoy at least 50% of the market. When one considers the short time they have been available, their growth seems nothing short of phenomenal. Also, when considering what they have to offer and the excellent job the suppliers of scale removers have done in quickly making these dry acid compounds widely available with built-in safety and convenience features, it seems a good bet that they will become even more popular in the future.

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Top performance in air conditioners requires that moisture stay where it belongs . . . and durable, moisture-tight 3M Sealer EC-373 sees to that!

The lasting, flexible seal of EC-373 is unimpaired by vibration, high or low temperatures. Its positive adhesion to metal makes a seal vibration can't break . . . that won't become brittle in temperatures low as -25°F. . . won't soften even at temperatures as high as +250°F.

When EC-373 seals inside compartments, water can't seep from one to another—or out onto the floor. It seals exterior cabinets so that moist air can't get inside. Freeze-ups are prevented. Insulation keeps dry. Apply EC-373 fast and easily by pressure gun, flow gun, hand caulking gun, brush or spatula.

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For more information about products advertised on this page use Information Center, page 59.

Repair Techniques Enable Firm To Meet Specifications, Keep Units Moving



GENERAL VIEW of Maple Service Co. air conditioner repair shop in St. Louis. Straight line conveyor enables any number of men to work on units, passing them along line without lifting. The equipment and system described in the accompanying article allows the firm to keep its promise of 48-hour service except for two hectic weeks at the height of the summer rush.

Provides 48-Hour Service on Air Conditioning Units Does Installation, Service Work on All Types of Units

By George M. Hanning

ST. LOUIS — Servicing and repairing air conditioning equipment may be a headache to most people, but it is bread, butter, and frosting on the cake for Louis Pocsai and William Kovacik.

Pocsai and Kovacik are president and vice president, respectively, of Maple Service Co. here.

Maple Service does factory authorized repair work on Vornado, Kelvinator, Westinghouse, Hotpoint, Mathes, Coleman, and Fedders air conditioners for distributors and dealers in the St. Louis area. For Hotpoint and Coleman, it handles repair work for distributors in several mid-western states.

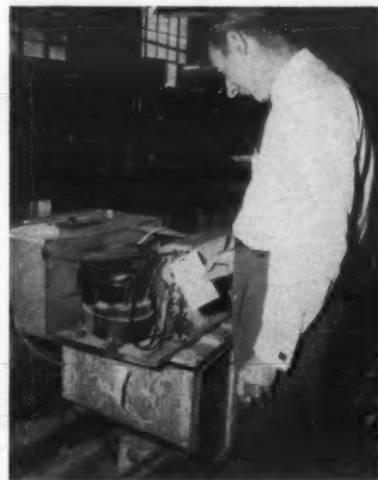
While not a large organiza-

tion, Maple has developed repair techniques that enable it to meet and even exceed factory specifications and still keep units moving through the shop at a fast clip.

The 48-hour service promised to manufacturers has been maintained except for two hectic weeks at the height of the summer season, Pocsai said. Only delays have been in getting replacement compressors from the factory.

"We can give same-day service in emergencies," Kovacik commented. "We are small and flexible enough to give such personal service when required."

Kovacik reports that the company has reworked 750 to 800



CHECKING A TAG on a unit awaiting its turn on the conveyor line is Louis Pocsai, president. Only time the unit will be manually lifted is when it is placed on the conveyor rollers.

air conditioning units since last spring and expects to raise that total to 1,000 before the year is out.

All this work has been done with a maximum of five refrigeration mechanics, supervised by Louis Davies, two helpers, parts and stock room clerk Jim Ford, and general expeditor Walter Urban in the shop crew.

In addition the firm does a high volume of installation and service work on room air conditioners, packaged central residential units, and auto air conditioners. (See Oct. 14 and 21 issues of the NEWS.)

How has Maple Service organized its high volume yet efficient repair operation?

Fully Conveyorized

Completely conveyorizing it has been a big factor in increasing efficiency, Pocsai pointed out.

"Up to this year, we used carts," he said. "But that didn't work so well. With the volume we are doing now, we find it much better to use the conveyor belt."

Big advantage of the steel roller conveyor is that it eliminates needless lifting of heavy equipment. Once a unit has been placed on the rollers, it can go through the entire repair operation without lifting. At the end of the line, a hoist swings the crated unit onto the customer's truck.

Sick air conditioners—either the complete unit or just the refrigeration chassis—come to Maple Service in shipments of six to 24 units from outstate distributors. Local distributors will bring in a unit at a time. "Some will make several trips a day," Pocsai smiled.

Uses 4-Part Tag

The newly arrived unit is immediately tagged with a four-part numbered tag. The tag number becomes the identification number of the unit while it is in Maple Service's hands. Everything pertaining to that particular unit will bear that number.

Because the tag is printed on heavy paper, it will resist defacing or tearing while in the shop. If the customer's order was left with the unit, it would get dirty, wrinkled, and torn in no time, Kovacik commented.

Each section of the tag is perforated so that it can be removed easily. The first section torn off is given to the delivery man as a claim check for the unit.

(Continued on next page)

RUBATEX ANSWERS AMANA'S DEMAND FOR "CONSISTENT INSULATION"



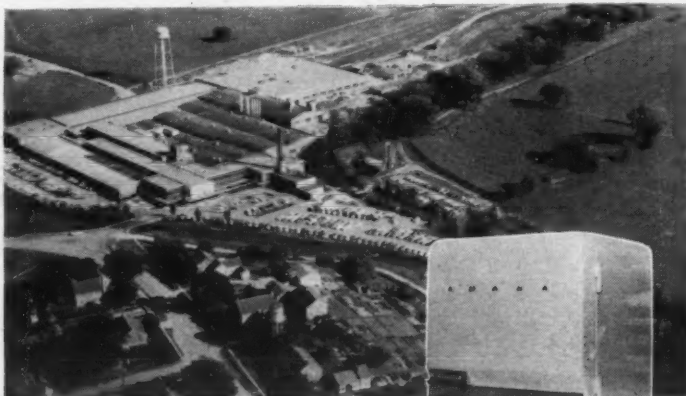
Rubatex's nitrogen-filled closed cellular structure makes it completely water-proof; gives it excellent weather-aging characteristics and longer life. Extremely light, soft and resilient properties make Rubatex most adaptable as insulation on any cold lines requiring sweating resistance in manufacture or installation of cooling equipment as well as for formed tubing insulation for commercial, industrial and residential cold line piping.

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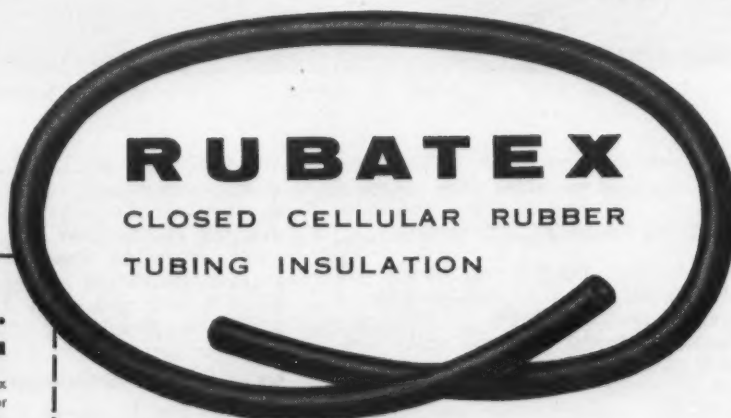
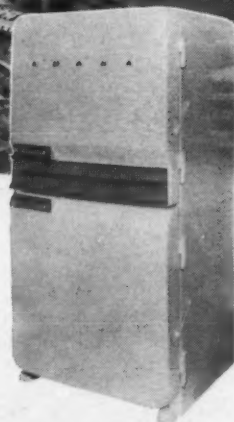
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.....closed cellular structure ends "sweat" problem on refrigerant line ...gives it unusual flexibility...plus longer life.

Shown here is the refrigerator evaporator coil of Amana's Freezer Plus Refrigerator. Amana engineering specifies a closed cellular type of insulation in order to avoid the problems encountered with other types of insulation for this application.



Rubatex Closed Cellular Rubber Tubing serves as insulation on aluminum tubing carrying the refrigerant from upper refrigerator compartment to lower freezer compartment in the FPR14 and FPR18 Freezer Plus Refrigerator models.



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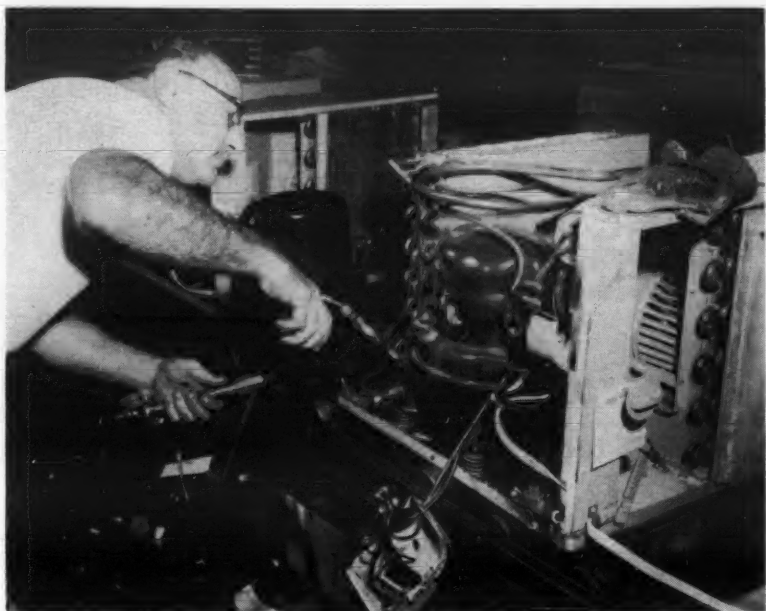
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Name _____

For more information about products advertised on this page use Information Center, page 59.



CUTTING AWAY LINES to remove a burnt-out compressor is Louis Davies, shop superintendent.



STURDY, WOODEN army surplus casings make ideal storage racks for the 350 compressors of varying characteristics that Maple keeps in stock. Note how racks are adapted to storage of smaller parts.

Firm's Repair Techniques -

(Continued from preceding page)

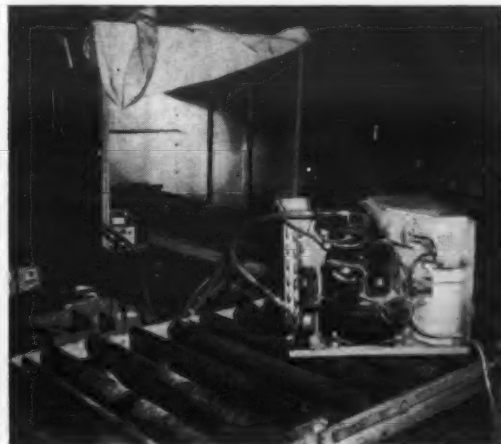
The second part, containing the name and address of the customer and the serial number of the unit, is sent to the office along with the customer's order.

The third and four parts remain attached to the unit. The third section contains the name and address of the customer and the serial number of the unit

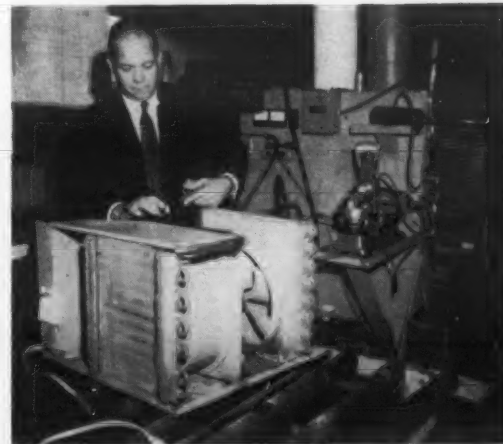
on its front. On the reverse side is marked the suspected trouble and the part number of any part to be replaced.

The fourth section contains the date the unit is received.

Thus tagged, the unit is lifted onto the conveyor line. The rollers stand about 2 ft. above the floor, putting the unit at a convenient working weight for



EVACUATION OF UNITS is centered around this spur conveyor, which will handle six units at one time. Ten-foot manifold along spur, connected to 15-cu. ft. vacuum pump, has six take-offs. At rear is heating oven where heat can be applied to speed evacuation. Note that evacuation is done on both sides of system at one time.



AFTER UNIT has been evacuated to 150 microns, Kovak couples hose to charge unit. Scale at rear enables charging to within 1/4-oz. of factory specifications.

depends on the number employed at the time and the volume of equipment coming through.

First step is to remove the shell of the air conditioner and set it aside. The shell is marked (Continued on next page)

the Maple Service mechanics. ing certain operations and passing the unit on to the next. The line fashion, each man performs scope of each man's work de-



"CALGON TREATMENT is by far the most effective"

J. L. Warren, Refrigeration Maintenance Engineer

Mr. Warren has been working with refrigeration equipment since 1918. He says that during that time he has found nothing to equal the Calgon Big 3 in effectiveness, economy and trouble-free use. Calgon® Scale Remover has been used to clean the water-cooled condensers so thoroughly that they have been restored to their original capacity, and Micromet® Plates are used to keep the system clean. Mr. Warren is the refrigeration maintenance engineer at Colonial Stores warehouse in Raleigh, N.C.

Calgon's Big 3 have established an enviable reputation among refrigeration and air conditioning maintenance people. Each of the three products does its job efficiently, safely and economically.

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2. Micromet Plates provide continuous treatment to inhibit further scale formation and to control corrosion. A single charge will last about six months and the inexpensive feeding bag is easily installed.
3. Calgon Algaecide controls algae and slime growths. Periodic addition keeps equipment operating efficiently.



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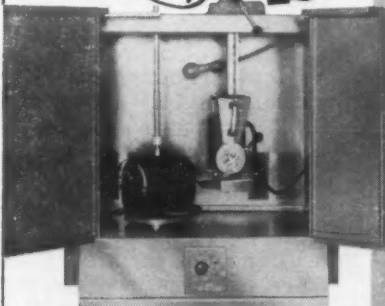


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IF THE VACUUM PUMP fails to pull down below 500 microns, the unit is sent into this leak-detector booth. Here William Kovacik, vice president, uses super-sensitive G-E leak detector.



USING SIMPSON three-lead thermometer, Kovacik checks coil temperature at three locations to see if coil is functioning properly.



END OF THE LINE finds repaired units ready for crating and hoisting onto distributor's truck. Even the larger residential attic air conditioners can be handled.

Repair Techniques--

(Continued from preceding page) in crayon with the unit's tag number. This leaves no question

about getting the proper cover on a unit after the work is completed. "This is particularly important with custom painted units," Kovacik said. "If the unit does not come back the same color that it went out, the customer

complains bitterly."

Next the unit is inspected to determine the extent of the trouble. Even when the fault is noted on the tag, the inspector goes over the unit thoroughly for possible additional defects.

Most common problem, Kova-

cik commented, is compressor failure.

"We carry a stock of about 350 compressors," Pocsai said, "and never have enough. There are so many variations in shape, size, relays, location of line connections and mounting brackets, and voltages that it is difficult to have enough of every type."

Maple doesn't cut into sealed units, Pocsai pointed out, because "Tecumseh doesn't permit it."

Replaces Sealed Unit on Burned-Out Compressor

When a compressor is burned up or has been operated with a broken line so that moisture has gotten into it, the complete sealed unit is replaced.

For convenience, compressors are stacked in racks along the wall a few feet behind the conveyor line. The racks are built out of army surplus casings, purchased at a great saving over commercial racks. They are stronger, too.

As a precautionary measure, he said, the repairmen check every compressor received for proper oil level. "We don't take anybody's word for it."

After the trouble is determined, the defective part—or complete sealed unit—is removed and replaced. The repairman notes on a piece of paper what new parts are used and attaches the paper to the tag.

Maple Service maintains a \$25,000 inventory of parts for units on which the company performs contract repair.

"We don't use high-priced refrigeration mechanics to chase parts," Pocsai said. "We let the common labor help bring them to the line."

The mechanic checks a parts catalog for the part number and gives this to a helper. The helper takes the part number to Ford in the stockroom. All parts in inventory are filed according to part number. Ford checks his card file for the number the helper gives him. The card tells him on what shelf in what row he will find the part.

When he turns over the part to the helper, he charges it to the tag number on the unit.

At the repair stage, or whenever soldering or unsoldering is done on a unit, the mechanic runs dry nitrogen through the system at 2 lbs. pressure to prevent flaking on the inside of the tubing when heat is applied.

"We use just enough nitrogen to feel the pressure on your hand or cheek," Pocsai commented. "We don't want to use too much. If we do, it will cause the liquid solder to bubble, leaving pinhole leaks after the

(Concluded on next page)



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Air Conditioner Repair Shop--

(Concluded from preceding page)
solder has hardened."

Kovacik noted that if the defective part had been in the refrigerant system, they put a new strainer in the system.

"Whenever a unit has been allowed to run with the refrigerant circuit exposed, such as with a line break, we flush it out, after the repair, with Refrigerant-11," he explained.

"Sometimes the lines are so dirty, the refrigerant comes out green at first. But we keep running refrigerant through until it comes out crystal clear."

Liquid Soap Used For 'Leak Detector'

"Know what we use to test for leaks?" smiled Pocsai. "Liquid soap. We rub it around the connections and soldered joints and watch for bubbles. Works out well, too."

This remark amused him because the company possess and uses a super-sensitive G-E leak detector. More of that later.

At this point, the exterior of the unit is cleaned up with a jet steam system. The condenser and evaporator finned coil surfaces are blown out with compressed air. Then the unit is ready for evacuation.

Pocsai emphasized that Maple Service goes to great lengths to get moisture out of the systems it repairs and to keep it out.

Tops Factory Specifications

Factory specifications usually call for the refrigerant system to hold an average vacuum of 800 microns for 30 seconds, he noted. Maple Service beats that by a considerable margin.

For evacuating the units it repairs, the company employs a 15-cu. ft. Kinney vacuum pump with six take-offs.

It normally pulls a deep vacuum down to 150 microns and has actually pulled down to 20 microns, Kovacik said. Heavy duty hoses are used, because light hoses collapse and flatten out.

The pump, manifold, and Hastings electronic vacuum meter which gives instantaneous vacuum readings, are located along a spur conveyor at right angles to the main line.

The spur is long enough to hold six units for evacuation at one time. This leaves the main conveyor line open so that this area can be by-passed.

Pocsai pointed out that the company evacuates from both sides of a system at the same time cut drying time in half.

When moisture may have penetrated into the sealed unit and is very stubborn about coming out, the mechanic slides the unit into an insulated booth.

Here, the unit, still connected to the vacuum pump, is subjected to heat up to 165° F. Two electric heating elements in the ceiling are thermostatically controlled so as not to exceed that temperature. Thus no damage will be done to rubber parts or insulation, Kovacik declared.

If speed is essential and a unit cannot be dried fast enough on the manifold, a 5-cu. ft. Kinney vacuum pump stationed nearby takes over. After a partial vacuum is pulled by the manifold, the system is shifted to the smaller pump. It brings the unit down to about 150 microns.

With this pump, readings are

taken off a Stokes-McLeod gauge, an absolute gauge with mercury column. A highly accurate instrument, according to Kovacik, it gives a positive reading in microns.

In addition to these two pumps, the company owns a small 2-cu. ft. portable model. It is employed on auto air conditioners and in rare cases where a system must be evacuated in the field.

"The little portable cost more than \$200, but it is worth its weight in gold," Kovacik testified.

A vacuum pump acts as an infallible check on small leaks, he said. If there is any semblance of a leak in a system, the pump can't pull a vacuum of less than 500 microns.

If this happens, the leaking system is shifted down the main conveyor line a few feet to a

leak detector booth where it can be examined with the super-sensitive G-E H-1 leak detector.

This booth straddles the conveyor line. After the unit rolls in, canvas curtains are dropped, completely sealing off the booth. A fan draws outdoor air into the booth through a ceiling duct. This introduction of forced outside air pressurizes the booth so that no refrigerant-contaminated air from the shop can get in.

The leak detector is turned on and pinpoints the leak.

When a system can hold a deep vacuum for 30 seconds, it is ready for charging.

For this purpose, Maple Service has rigged up a simple charging board equipped to add the precise factory-specified charge to within 1/4 oz.

Charging is done by weight. Refrigerant—either 12 or 22 as required—flows by gravity from inverted 145-lb. cylinders through a dryer and into a small 5-lb. drum resting on a

scale. Weights on the opposite arm of the scale are balanced to the precise amount required.

The scale balances so that when the specified amount of refrigerant has been drawn from the small cylinder, the indicator points to 0. The 0 point is in the center of the dial, which is marked to indicate only the last 2 oz. of weight.

From the small cylinder, refrigerant flows through a feeder line coupled to the system. A hand valve controls the flow.

Until the last few ounces of refrigerant passes into the system, the indicator arm remains at rest. When this point is reached, it starts to move toward 0. When the indicator starts to move, the mechanic throttles down on the valve, shutting off the flow completely exactly on 0.

Maple Service possesses large wall charts showing specifications for each model.

The man charging the system

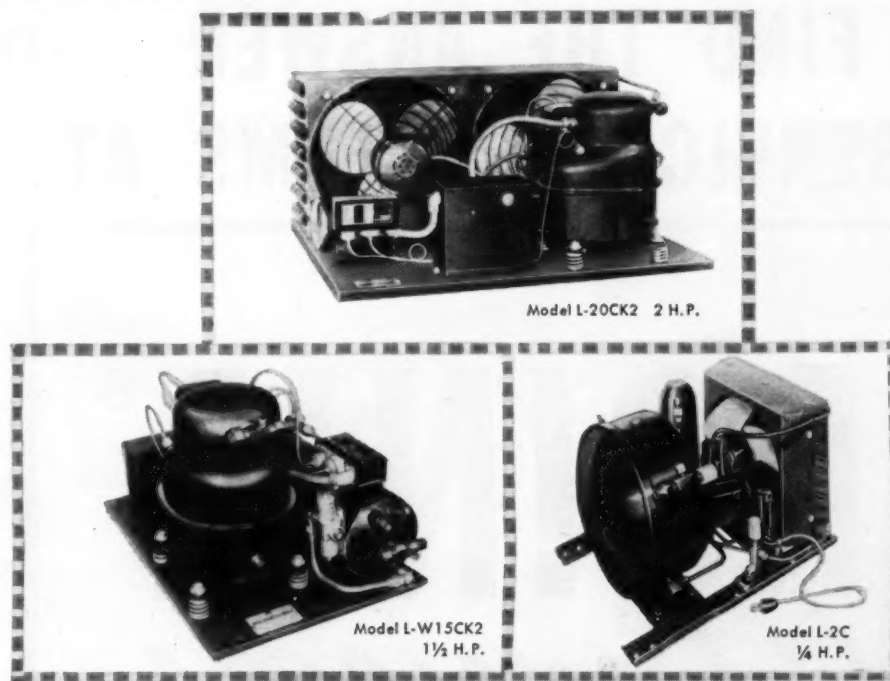
reads the correct charge off the chart. From it, he also finds the specified wattages and voltages the unit should pull. A wattmeter and voltmeter make it a matter of seconds to check these factors too.

Also used at this station is a Simpson thermometer with three leads. By touching these leads to any points on the coil, temperatures can be checked as an indication that the coil is functioning properly.

Completely checked out, the units roll to the reassembly area near the end of the conveyor line. Here, the shell, if it accompanied the unit, is cleaned, touched up, and replaced.

A small paint spray booth at the end of the conveyor line is used for any painting that has to be done. This, at times, has included custom coloring of auto air conditioner evaporator covers to match the car interior.

Presentable again, the units are reassembled and shipped.



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Refrigeration Problems

And Their Solution

(As Written by Paul Reed)

The late Paul Reed, one of the refrigeration industry's most respected writers and teachers, wrote a column on "Refrigeration Problems and Their Solution" which was published regularly in AIR CONDITIONING & REFRIGERATION NEWS for more than 15 years.

Readers throughout the years have hailed this written material as some of the most practical and helpful that has ever been published. Fortunately, the author had an opportunity to revise some of this material and the NEWS is currently re-publishing it.

of the compressor. Not only are the capacity and efficiency of the compressor affected by the pressure drop through the evaporator, but they are also affected by the pressure drop through the suction line, including pressure drop through regulator valves, fittings, heat exchangers, or anything else in the evaporator or suction line that restricts the flow of refrigerant gas and thereby produces pressure drop.

Any pressure drop from the inlet of the evaporator to the cylinders of the compressor affects the compressor and reduces its capacity and efficiency.

A compressor cannot tell what the temperature of the evaporator is, nor what the pressure is in the evaporator. It can deal only with the gas as it gets it. If the pressure of that gas is high and saturated, the compressor's capacity and efficiency are high.

If the pressure of the gas delivered to the compressor is low, and is superheated a great deal (warmed above the temperature at which the refrigerant is boiling in the evaporator), the capacity and

efficiency of the unit are low. So the nearer that the pressure and temperature of the gas at the compressor is to the pressure and temperature of the refrigerant at the inlet of the evaporator, the more capacity will the compressor have and the lower will be the cost of electric current per B.t.u. Table 3 shows the capacities of the same compressor running at the same speed, but at different suction pressures, and with the gas entering the compressor at 65°.

This shows that operating at 9 p.s.i.g. on a 0° evaporator, this compressor has over twice as much capacity as it does when operating on a -25° evaporator at a 2-in. vacuum, but only a little more than one half as much as when operating at 25 p.s.i.g. on a 25° evaporator. This table shows the effect of suction pressure and evaporator temperature on compressor capacity.

SUCTION PRESSURE DROP REDUCES COMPRESSOR CAPACITY

It shows also the effect of suction pressure drop on compressor capacity. For example, suppose

Table 3

Suction Pressure	Evaporator Temperature °F.	Capacity B.t.u. Per Hour
Refrigerant-12		
2" vacuum	-25	1,160
.6 p.s.i.g.	-20	1,380
2.5 "	-15	1,580
4.5 "	-10	1,850
6.5 "	-5	2,130
9.0 "	0	2,450
12.0 "	5	2,860
14.7 "	10	3,250
17.7 "	15	3,750
21.0 "	20	4,250
25.0 "	25	4,770
28.5 "	30	5,280
30.5 "	32.5	5,550
32.5 "	35	5,790
37.0 "	40	6,300
41.5 "	45	6,800

that the suction pressure at the inlet of the evaporator is 32.5 p.s.i.g., corresponding to 35°. By the time the gas gets to the compressor its pressure has dropped 2 p.s.i.g. to 30.5 p.s.i.g. (corresponding to 32.5°) and it has warmed up (superheated) to 65°.

If there had been no pressure drop, the capacity would have been 5,790 B.t.u. per hour. Because of the 2-lb. pressure drop (32.5 to 30.5), the capacity of the compressor has dropped from 5,790 to 5,550 B.t.u. per hour, a loss of 240 B.t.u. or over 4%.

PRESSURE DROP COSTLY IN INCREASED OPERATING EXPENSE

A loss of capacity of 4% might not be too serious, but what effect would the same pressure drop of 2 p.s.i.g. have at low temperatures, say, in case of a -10° evaporator? The suction pressure at the inlet of the evaporator is 4.5 p.s.i.g.

If there were no pressure drop, the compressor would have a capacity of 1,850 B.t.u. per hour. If the pressure drops 2 p.s.i.g. from the inlet of the evaporator, the suction pressure would be 2.5 p.s.i.g. and the capacity 1,580 B.t.u. per hour. The loss in capacity would therefore be (1,850 - 1,580) or 270 B.t.u. per hour; a loss of almost 15%.

This great a loss of capacity could very well mean that the compressor would have to run continuously to carry the load, or it might mean that even with continuous operation, the compressor would not be able to keep temperatures.

What then are permissible pressure drops in the low pressure side of the system? In its "Equipment Standards," the Air Conditioning and Refrigerating Machinery Association gave the following maximum permissible suction pressure drops for 100 ft. equivalent suction lines.

Although these recommendations apply particularly to the pressure drop of the suction lines from the outlet of the evaporator to the compressor, it is the writer's opinion that the total pressure drop, including that of the evaporator and the suction line should rarely exceed the values given in Table 4.

It is not uncommon to find evaporators for use at 0° or below, with a pressure drop of 2 to 3 p.s.i.; nor is it uncommon to find suction lines from 0° evaporators, with pressure drops of 2 to 3 p.s.i.

A total suction pressure drop of 5 p.s.i. would mean a loss in capacity of almost 30% of a capacity of almost 30% of a capacity.

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Pressure Drop (4)

In the previous instalment, it was found that pressure drop through the evaporator reduces the capacity of the evaporator by affecting the ability of the thermostatic expansion valve to keep the evaporator fully active. It was explained that this could be corrected to some extent by readjusting the TEV to maintain a lower superheat, and by using an ex-

ternal equalizer on the TEV.

These remedies help the effectiveness of the evaporator by enabling the TEV to maintain a low superheat. They do not affect the pressure drop; it stays practically the same.

SUCTION PRESSURE AFFECTS COMPRESSOR CAPACITY AND EFFICIENCY

It was also mentioned that pressure drop through the evaporator reduces the capacity and efficiency

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Table 4

Evaporator Temperature °F.	Maximum Permissible P.S.I.
-20 to 0	1/2 to 1
0 to 25	1 to 1 1/2
25 to 50	2 to 2 1/2

Pressure Drop--

(Continued from preceding page) densing unit operating on a 0° evaporator.

This would mean an increase of running time of about the same percentage. The electric bill would not be 30% greater, for the motor would be running more lightly loaded, but it could very well be as much as 20% greater.

Thus a 5-lb. pressure drop that might go unnoticed, could be costing the user an additional 20% in operation. Excessive suction pressure drops are more common than might be supposed. They may not be recognized, for the suction pressure is usually read at the compressor only.

HOW TO DETERMINE PRESSURE DROP

The pressure drop of the suction line only, may be determined by installing a gauge at the outlet of the evaporator and comparing it with the gauge at the compressor suction service valve.

Pressure drop through the evaporator can be determined by installing gauges at the inlet and outlet of the evaporator and comparing them. Care must be taken that the gauges are accurate and zeroed with one another.

The pressure at the inlet of the evaporator may be determined with a fair degree of accuracy by clamping a thermometer bulb to the inlet tube of the evaporator, at the outlet of the expansion valve; if it is read carefully, the saturation pressure from the table for Refrigerant-12 or whatever refrigerant is being used, corresponding to the thermometer reading, is the pressure in the evaporator inlet.

This same method of determining pressure in other parts of the evaporator may be used, providing that the refrigerant is saturated at that point; that is, that there is still liquid there. This method of determining pressure cannot be used in the superheated portion of the evaporator, nor in the suction line.

Table 4 is the maximum permissible suction pressure drop of the suction line, assuming negligible pressure drop in the evaporator—which, however, is not always a permissible assumption. If there is any suspicion of excessive pressure drop through the evaporator, gauges should be installed and the evaporator pressure drop checked as well as the suction line pressure drop.



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Norge Relocates National Appliance Service Headquarters, Names Hyde Chief

CHICAGO—Relocation of appliance national service headquarters from Muskegon, Mich. to Chicago was announced by Norge Div., Borg-Warner Corp.

In addition, the appointment of Thomas P. Hyde as national service manager of Norge was announced by Elmer G. Fenton, director of national service.

Hyde, who has been Norge manager of defense contract sales since Dec. 12, 1955, will be responsible for distributor, dealer, and field product service matters. He will coordinate activity of Norge national service product specialists.

Fenton said his staff and product specialists will have their offices in 2,300 sq. ft. of additional Norge floor space in the company's national headquarters at the Merchandise

Mart. These men direct Norge national home appliance service activity.

Service executives now in Chicago include Hyde: L. L. Hope, field service manager; and Earl Davidson, refrigeration specialists.

Produce specialists are Oscar Kuck, automatic and wringer washers; Jacob Van Domelen, ranges and water heaters; Charles Cushway, refrigerators and home freezers; Jim Kidd, gas and electric dryers; Hank Dehmer, customer relations; Alvin Lantz, special assignments; and Don Idarius, service training specialist.

"Not only is Chicago more strategically located for traveling purposes, but the staff will now be more centrally located to our other plants."

Water Service Expands Main Office

NEW YORK CITY—In its second expansion move in little more than a year, Water Service Laboratories, Inc., chemical engineer and specialist in corrosion control, has leased for its main office 18,000 sq. ft. of space in the Rogers building, 615 W. 131st St., it is announced by Henry L. Shuldener, president of the company.

The new headquarters contains 50% more space than the service organization's present building at 423 W. 126th St. Occupancy of the new space has been set for early 1958 after necessary alterations are done.

The new quarters are adjacent to Water Service Laboratories' service annex at 609 W. 131st St. which was opened in 1956 as a center for manufacturing and packaging water-treating chemicals.

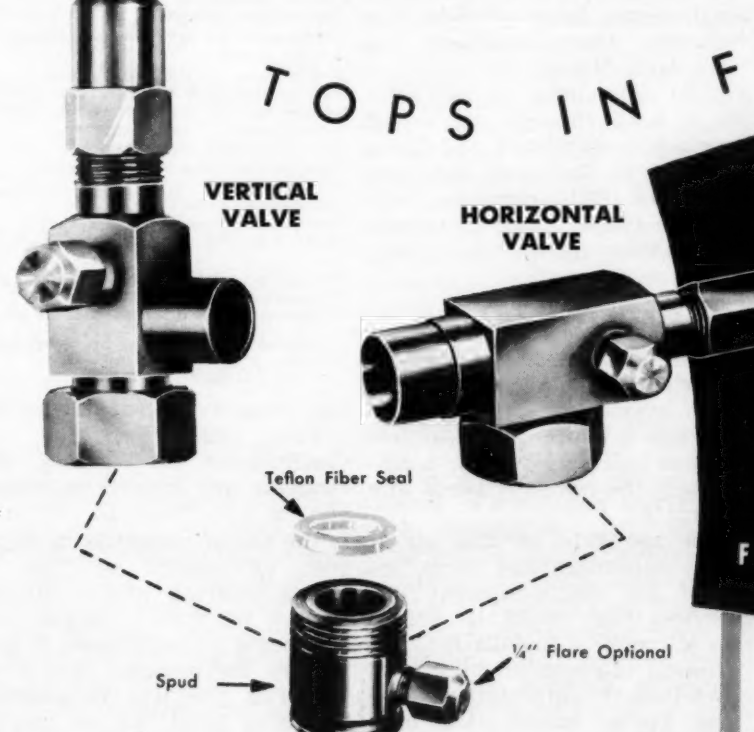
The firm's new space will accommodate enlarged laboratory facilities in which an expanded program of research on water corrosion is contemplated. Additional office space will also be provided to meet the needs of the organization's rapidly-expanding business volume, particularly in the air conditioning and refrigeration fields.

Bastian-Blessing Service School Due 6-7

CHICAGO—Bastian-Blessing Co. will hold a service school Dec. 6 at 7 p.m. in Lynchburg, Va., at the headquarters of its distributor, Grant E. Key, Inc., 1811-1831 Memorial Ave., the

firm announced. Cecil Merryman, manager of the company's Service Dept., will be in charge, and all refrigeration and service men in that vicinity are invited to attend.

TOPS IN FLEXIBILITY...



VERTICAL VALVE **HORIZONTAL VALVE**

Teflon Fiber Seal

Spud 1/4" Flare Optional

Primore's NEW

ROTALOCK VALVE

For COMPRESSOR • RECEIVER • CONDENSER

Since its introduction, Primore's new Rotalock Valve has saved its users many thousands of dollars. Because of maximum flexibility, air conditioning equipment manufacturers and service people can get along with considerably lower inventories, save guess work and save on installation time.

Rotalock is a new type of detachable valve which permits the positioning of suction or discharge valves to rotate to the most desired angle.

DETACHABLE

Rotalock gives maximum flexibility in production, as well as servicing of air conditioning systems. Production or engineering changes involving connections and tubing can be made without ordering different valves.

ROTATES A FULL 360°

Rotalock may be set at any angle to correspond with direction of tubing. Eliminates short or compound bends.

LOCKS IN ANY POSITION

After determining angle for best installation, just lock Rotalock into correct position. This angle may be adjusted or changed if necessary.

The new TEFLON FIBER SEAL insures a positive seal at all times and can be used many times without replacement.


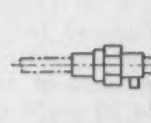
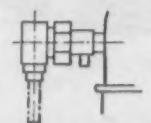
REDUCES INVENTORY

The high flexibility, simplicity of design, and economy of Rotalock are all important factors... mean less paper work—less handling—less money tied up in inventory.

THREE TYPES OF CONNECTIONS

Straight or Angle Adapters Available

Primore Rotalock may be connected direct to Compressor, Receiver or Condenser, however, if conditions are such that this is impractical, then straight or angle adapters can be used. The adapters fit spud, which is brazed onto compressor, etc., as shown here.

ROTALOCK VALVE **STRAIGHT ADAPTER** **ANGLE ADAPTER**

For shipping of compressors and other equipment, shipping caps are available. These permit makers and suppliers to ship components without valves. Customers can thus purchase valves from Primore direct.

OTHER FAMOUS PRIMORE VALVES: Base, Angle, Receiver, Breakaway, Compressor Pad Valves and Pad Fittings.

Write for fully illustrated catalog. Gives data and description of entire line of Primore Valves.

Primore Sales, Inc.

2460 South Main Street • Adrian, Michigan

REFRIGERATION: designing • engineering • sales

Selling a Cooling System for Export

Miami Firm Sets Up To Sell Not Only a Product, But Installation and Maintenance Service, Too

By George M. Hanning

MIAMI, Fla. — "Contrary to the belief of many people involved in export in this area, the overseas purchaser actually wants to be sure that he is getting what he is paying for and wants the equipment installed correctly and satisfactorily even though he may only be purchasing window units."

That, believes Marshall Berkson, senior executive of Air Conditioning Distributors here, accounts for the immediate success of his firm's export program.

That program is designed to give the overseas purchaser all the materials needed for a good air conditioning installation wrapped up in one package plus all the engineering, service, and installation help he desires.

The Caribbean area purchaser can get all this quickly and

with a minimum of confusion through two forms prepared by Berkson's firm. They make it almost as easy to order a complete air conditioning system as a refrigerator from a catalog house.

"Since we do not hedge or make nebulous statements concerning what we can give the Caribbean area customers in the way of services, these people are willing to pay a fair price for such services. We find the entire transaction to be mutually profitable," Berkson said.

Services Offered

Air Conditioning Distributors export program, in operation only a few months thus far, covers:

Room air conditioners.

Central air conditioning units.

Allied supplies such as cool-

ing towers, registers, grilles, all types of ductwork, copper refrigerant tubing, galvanized and plastic water pipe, duct insulation, water pumps, and miscellaneous parts, controls, and accessories.

Service maintenance including installation supervision, service tools and supplies, warranties, and maintenance contracts.

Engineering and application. "We sell all products and services f.o.b. Miami," Berkson explained. "We prefer to make quotations through an export and import company so that that company can handle all the details concerning documents, etc."

"However, from time to time, we will quote direct to hotel or engineering firms outside this country. Our quotations are still f.o.b. Miami."

"To date, most of our sales have been through an export company established and doing business in the Latin American countries. This company buys our services and products, marks them up, and resells them to its customers."

Quotation Form 'A'

Here is how Air Conditioning Distributors handles quotations from overseas:

When a Latin American expresses an interest in air conditioning, the company sends him "Form A."

On one side of this single sheet mimeographed form are listed all the equipment and services that might be needed for a complete installation. The prospect is asked to check after each item the information he desires (price, specification, location or layout recommendation).

Along with this request, he is asked to send a sketch or drawing of the spaces to be air conditioned.

If the exact specifications of the equipment, tonnage requirements, and B.t.u. capacity desired are not known, the prospect is to fill out the simple but complete air conditioning and heating survey form which is on

Estimate Form 'A' for Export Customers

Forward to

AIR CONDITIONING DISTRIBUTORS
763 N.E. 79th St., Miami, Fla., U.S.A.

REQUEST FOR AIR CONDITIONING EQUIPMENT ESTIMATE

- Note: a) Check blanks below, for information desired. This information will be given within five days of receipt of this form.
b) A drawing or sketch of the space(s) to be air conditioned must accompany this request. The layouts requested below will then be prepared and all sketches and plans will be returned.
c) If the exact specifications of the equipment, tonnage requirements, and B.t.u. capacity desired are not known, the reverse side of this form must be completed before the information checked below can be given.

Air Conditioning Unit(s)***	Price	Specification	Location or layout
Heating
Plenum chamber (no ductwork)
Humidifier
Thermostat
Controls
Ductwork—Aluminum
galvanized
fiberglass
duct insulation
registers—aluminum
registers—galvanized
For water-cooled installations
water regulating valve (no tower)
Cooling tower—atmospheric
Cooling tower—forced draft
sea water kit
pump
tower piping*
water piping from well*
water piping from city water**
If air conditioning is not to use water
refrigerant copper tubing
insulation for suction tubing
Exhaust fans
Ceiling insulation
Condensate piping*
Refrigerant in cylinder (including extra supply)
Refrigerant oil (including extra supply)
Test gauges and adaptors (for service)
5-year factory refrigerant warranty
Supervision of installation**
Check test and start service
Periodic maintenance agreement
Service manual
Installation manual
Operating manual
Check test and start instructions

*Please specify whether copper or galvanized pipe is requested.

**Including room and board.

***Specify if room type units or central unit(s) are desired.

Name of individual or company making request
Address

the reverse side of the sheet. check test, and start service; or

From this information, Air Conditioning Distributors will complete any layouts requested and fill out "Form B." Form B

is the bill of materials made up from information on Form A, giving shipping weight, quantity, net price f.o.b. Miami, and comments on each item. It also notifies the prospect that if he wants a complete installation, including labor, he can get it.

Bill of Materials 'B'

Form B and the layouts requested are returned to the prospect within five days of their receipt. If the prospect decides to buy, he notifies the export company or Air Conditioning Distributors. Then Air Conditioning Distributors prepares the materials or items requested and crates them for delivery.

If supervision of installation;

To this price the customer must add first class transportation cost to and from the point of installation plus \$50 per day expenses.

Transportation Charge

Thus, if periodic maintenance three times a year is requested, the transportation costs to and from the point of installation times three plus \$50 per day must be added to the periodic maintenance agreement price. One day must be allowed at installation site plus whatever trip time is involved.

Under the periodic maintenance agreement, a service engineer will call once, twice, or

(Concluded on next page)

ONE WEEK DELIVERY!

TRU-AIR

QUALITY CONTROLLED
HEATING
AND
COOLING
COILS

Helical fin, solder bonded to 5/8 O.D. copper tube with copper or aluminum fins, 3, 7, or 8 fins per inch. Also available in 3/8, 1/2, and 1-1/8" O.D.

Heating coils available in standard and non-freeze types to withstand steam pressures to 200#. Water heating coils to 400° temperatures. Higher pressures and temperatures available to order.

Cooling coils available for Freon, brine, glycol, ammonia, and water. Direct expansion type furnished with liquid distributor and expansion valve. Water coils available in cleanable tube removable header type. Low temperature coils with hot gas defrost headers for heat pump work available.

Coils are available in sizes from 4 tubes high to 36 tubes high and from 12" to 180" finned length with up to 30 rows in depth. All-rows are staggered in direction of air flow. Special replacement coils to fit standard units of national manufacturers can be made to order. Coils available in all types of materials, including stainless steel.

34 page coil catalog available on request.

CALL, WRITE
OR CABLE

M. Blazer & Son

MANUFACTURERS • WHOLESALERS
HEATING AND COOLING EQUIPMENT

PASSAIC, NEW JERSEY

Cable: Blazer, Passaic

Coils, Spray Coil Dehumidifiers • Air Conditioning and Multi-zone units to 50,000 CFM and 9" total static • Air Cooled Condensers to 200 tons • Cooling Towers • Mechanical Dehumidifiers to 50 tons • Slug Eliminators.



**SAVE 2 WAYS WITH
FURNAS "IN-BETWEEN"
STARTER SIZES**

LOWER COST—save up to 25% by buying the exact size starter for the job, instead of having to take a standard one that may be too large.

LESS SPACE—save up to 40% by selecting a compact starter of a size designed to fit your requirement.

Furnas offers you 10 Magnetic Starter sizes instead of the usual five—5 standard and 5 "in-between" sizes. The "in-between" sizes allow you to choose the control that is exactly suited for your particular job when a standard size is not quite right. No need to waste money or space on a starter that is too large.

For information on our complete line of air conditioning and refrigeration controls, write for Bulletin 5519. Furnas Electric Company, 1111 McKee Street, Batavia, Illinois.

A32



FURNAS ELECTRIC COMPANY
BATAVIA, ILLINOIS

SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

DATA FOR HEATING, AIR CONDITIONING SURVEY

Address of Installation Type of Business or Use
 Current Available: Voltage phase cycle amperage
 Water Pressure Available p.s.i. (if water-cooled equipment is desired).
 Type of Water Available: salt hard fresh soft fresh
 Type of equipment desired: water-cooled air conditioning with recirculating tower
 water-cooled air conditioning without recirculating tower
 Waterless air conditioning (no water required).
 Heating by electricity LP gas Mfg. gas oil

COMPLETE ONLY THOSE ITEMS WHICH ARE DIRECTLY EXPOSED TO SPACE TO BE AIR CONDITIONED

Walls or portions of wall exposed to outside (in net sq. ft. of surface).	Shaded			Unshaded		
	North	East	West	South	North	South
Glass in Outside Walls (in net sq. ft. of surface)	North	East	West	South	Shaded by	Unshaded
					Trees	Buildings
					Awnings	Venetian Blinds
					Shades	
Types of Windows (in net sq. ft. of surface)	Casement	Double Hung	Jalousie	Glass Brick	Solid Glass	Awning

Is there an attic over space to be air conditioned? Yes No
 What is above the space to be air conditioned?

Ceiling—Complete in net sq. ft. of surface area if over space to be air conditioned.

Type of roof	No insul.	2" insul.	2" or more
Corrugated iron
Tar paper on 1" or more wood
Felt roofing on 1" or more wood
Composition roofing on 3" concrete
Composition roofing on 6" concrete
Sprayed roof—all wetted surface
Other

Skylights sq. ft. of surface
 Partitions next to air conditioned area sq. ft. of surface

FLOOR
 Over finished rooms or basement sq. ft. of surface
 Over ground sq. ft. of surface

Cubic Feet of Air Per Minute of Exhaust Fan C.f.m.
 Normal Number of People As One Time People
 Lights in watts on sunny day) Watts
 Number of Coffee Urns Urns
 Lineal Feet of Steam Tables Lineal Feet
 Total Horsepower of Motors Horsepower
 Total Watts of Other Electrical Apparatus Watts
 Gas Burners for Cooking Burners

Volume of Building to Be Air Conditioned: L. ft. W. ft. H. ft.
 Number of Floors to Be Air Conditioned Number of Rooms

Air Conditioning Export--

(Concluded from preceding page) three times a year (at the option of the purchaser) to check the equipment and render the service outlined in the service contract. He will also recommend any changes or new parts required to keep the equipment performing satisfactorily.

Warranties, if requested, are given f.o.b. Miami. Warranties on parts and materials can extend from one to five years. Again, the purchaser is required to absorb all shipping costs between Miami and the installation site.

If supervision of the installation is requested, an application engineer will oversee the installation and insure that it is in accordance with good practices

to enhance the life of the machinery.

If desired, the purchaser may call upon the application engineer to make the first visit only on the day that the equipment is scheduled for original start-up. At that time the engineer will check the items outlined on a check, test, and start form, check the installation, and advise the owner of any changes required to effect satisfactory operation of the equipment installed.

Additional charges for his time are the same as described for the service engineer.

The people of the Caribbean and Latin America "want air conditioning and they want the best," Berkson asserts.

For reliability in refrigeration and air conditioning equipment—look to VILTER!

With the Vilter line you will find reliability an accepted byword nationally. Thousands of satisfied customers will stand up for Vilter equipment's dependable service; long life; efficient, economical performance—equipment backed by ninety years of intense activity in engineering, research, and installation know-how in the refrigeration and air conditioning industry.

With the versatile Vilter line you can handle practically any commercial and industrial refrigeration and air conditioning application in your area on an attractive competitive basis. Included in the Vilter line are ammonia and Freon compressors from 10 HP to 200 HP and larger, booster compressors, condensers, blast freezers, Uni-Chillers, brine coolers, heat exchangers, Pakicers, Polarflake ice machines, latent heat storage systems, Vertibay coils, water coolers, shell and tube vessels, air conditioners,

Zer-O-Disc fin coils, and rotary liquid pumps among others. Vilter supplies equipment to the dairy, brewery, food, fishing, meat packing, canning, chemical, and vegetable processing industries; also for stores, churches, office buildings, and industrial plants.

Vilter distributors receive strong home office support. Engineering application counsel is always available. Field tests are conducted regularly to try new applications... to suggest installation improvements. The Vilter line is advertised widely in the trade press with distributor applications being featured.

It will pay you to consider the Vilter line for your area. Why not get acquainted? You will like our way of doing business. For full information write to Department G, The Vilter Manufacturing Company, 2217 South First Street, Milwaukee 7, Wisconsin.

THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wis.
 Ammonia & Freon Compressors • Pakice & Polarflake Ice Makers • Ammonia Liquid Transfer Systems • Evaporative & Shell Tube Condensers • Pipe Coils • Valves & Fittings

Vilter
 REFRIGERATION and AIR CONDITIONING

Studies Water

Freezing Process To Convert Salt to Fresh Described by Carrier

WASHINGTON, D. C. — A freezing process for converting salt water to fresh, now under study at Carrier Corp., was described by C. M. Ashley and C. M. Bosworth at the Saline Water Conservation Symposium here Nov. 4 to 6.

The meeting heard reports on various salt-removing methods under development to help solve the fresh water supply problem, which is a source of growing concern in many parts of this country and the world. It is sponsored by the Office of Saline Water of the U. S. Interior Dept. and by the National Academy of Science National Research Council.

Ashley, chief staff engineer of Carrier's Research and Development Div., and Bosworth, senior research engineer, described work on the freezing technique, which is being conducted under a contract from the Interior Dept. The project covers both creation of a suitable process and evaluation of its economic feasibility, it was pointed out.

Some 39 representatives of university and corporation research groups spoke during the three-day program.

Sees 'Real Rash of Cooling' Being Put In Sports Bldgs.

LOS ANGELES—Air conditioning is making a fast tie-in with recreation and sports buildings, according to Fred E. Schmuck, national sales manager of Drayer-Hanson, Div. of National-U. S. Radiator Corp.

Schmuck noted that this past summer his network of sales agents accounted for orders for a "real rash of cooling equipment" which "should make many a sportsman happy."

Projects included air conditioning bowling alleys in Corpus Christi, Texas and Phoenix, Ariz.; a gymnasium in Albuquerque, N. M.; a ski-mobile at North Conway, N. Y.; country clubs in Lafayette, La. and Berger, Texas; and national headquarters building of a home exerciser making firm here.

1,400 Through-the-Wall Units Condition 13-Story Apartment Bldg. Year-Round

PHILADELPHIA — A new system of heating and air conditioning apartments has been completed in a 13-story apartment house here.

Engineered and manufactured by Lewyt Air Conditioning Corp., Long Island City, the system comprises built-in wall units that provide either heat or cool air. Fourteen hundred through-the-wall units have been installed in the Cherry Hill Apartments, with one in every bedroom and living room.

According to the manufacturer, each unit is connected with the building's hot water heating system and the conventional radiator or convectors have been eliminated.

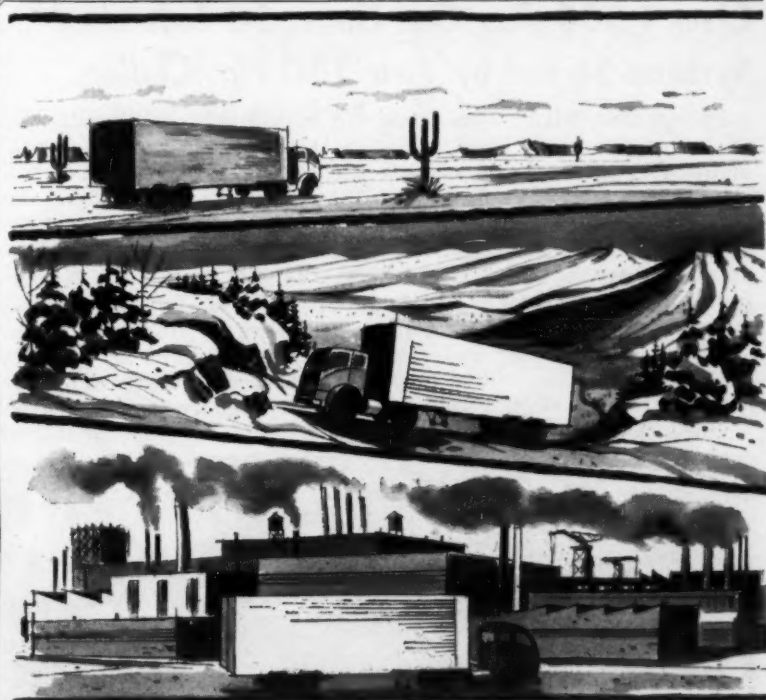
"Using a flow of hot water through its built-in coils, a unit maintains a comfortable room

temperature even when the outside thermometer has a reading of -10°," the announcement said. "Its 1-ton cooling system is just as effective in hot or humid weather."

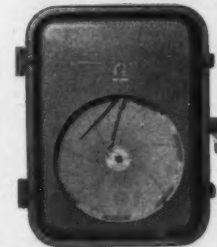
A thermostat controls the room temperature whenever the unit is in operation.

In appearance, the unit looks like built-in wall air conditioners produced by Lewyt in recent years. It is 14½ in. high, 15 in. deep, and 32¼ in. wide. It does not project into room and has no overhang outside.

E. J. Frankel, builder of the Cherry Hill Apartments, reported that a substantial savings had been effected by installing the combination heating cooling units. He said the savings were reflected in the elimination of the usual radiators.



partlow



Partlow Recording Temperature Control for applications where continuous temperature record is essential.



Partlow Indicating Temperature Control for use where no temperature record is required.

controls in-transit temperatures...and proves it...under any road conditions!

Partlow Temperature Controls are being specified on more and more in-transit applications — because rough-road vibration and shock will not upset them... or lessen their accuracy! Products can be trucked through any extremes of temperature, shipped over hardest-to-haul highways — and these mercury-actuated controls will maintain their precise settings to within 1% of scale range!

Partlow Recording Controls maintain temperatures, at the same time providing a continuous temperature record, from start to destination.

Indicating and non-indicating controls also available for truck or railway transportation.

Specify Partlow for stationary applications where accuracy and super-dependability are essential.

Tell us your temperature control problems. Our Engineers will gladly work with you.

MAIL COUPON FOR DATA

THE PARTLOW CORPORATION

Dept. C-1157, 2 Campion Road, New Hartford, N.Y.

We are interested in Partlow Controls for the following applications:

☐ Have representative call

☐ Send catalog data

Company.....

Street and Number.....

City.....

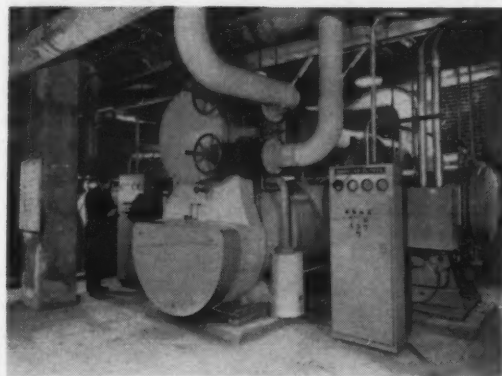
State.....

Signed.....

Hotel's Built-In Air Conditioning System Permits Beauty In Design



FULLY air conditioned Sheraton hotel in Philadelphia. Louvered air intakes at 4th floor level are shown.



"TONRAC" refrigerating machines made by American Blower that supply chilled water for air conditioning system. Huge units are mounted directly on the slab of the 4th floor at the building load center, directly above function rooms.



A VIEW of hotel dining room. Note how modern-design ceiling diffusers are coordinated with ceiling lighting pattern.

Over 1,000 Fan Coil Units, 30 Individual Systems Served by Two 350-Hp. Chillers

PHILADELPHIA — The new 22-story Sheraton hotel, officially opened in March of this year, is Philadelphia's first to be designed with built-in air conditioning. Built at a total cost of 16 million dollars (price includes furnishings), the new structure is the largest in the skyscraping group of Penn Center buildings that comprise the city's most dramatic urban development. Since the hotel was designed

for built-in air conditioning, full integration of required equipment could be accomplished at the early planning stage two years ago. The engineers and architect started together from scratch and worked as a team. John K. M. Pryke, principle, of the firm of Slocum & Fuller, consulting engineers of New York City who designed the air conditioning system, describes one example of the benefits of

architectural-engineering teamwork in this way:

"The careful arrangement of the individual room air conditioning units, in conjunction with the windows, and the use of complete air conditioning throughout, permitted a treatment of the building facade that seems to make the long rectangular prism of the hotel float in space.

"This is markedly accented by the air intakes which appear at the fourth floor level as a long line of colored metal louvers (Fig. 1). This is just one example of how the ultra-modern beauty of the Sheraton reflects the efficiency of its air conditioning system."

SYSTEM SPECIFICATIONS

The Sheraton has a gross volume of 5,700,000 cu. ft. of air conditioned space. The air handling equipment circulates 67,000 lbs. of air per minute. There are 12 air changes each hour, made up of 75% return air and 25% fresh air.

The interior system supplies conditioned air to the interior zone of the building through air diffusers, maintaining 80° F. in summer and 70° F. in winter under design conditions.

Chilled water is supplied by two American Blower Tonrac nominal 350-hp. refrigerating machines hooked in parallel to produce lower pressure drop, reduced pumping head and less tube erosion. The two hermetically sealed, electric motor driven, single stage centrifugal compressor units are capable of handling 110% of rated load

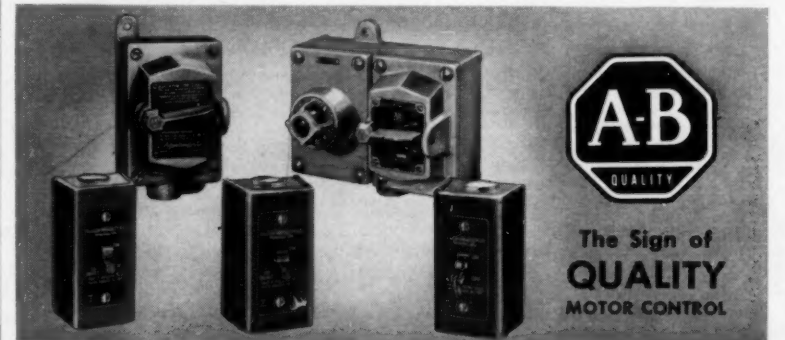
under continuous duty conditions.

More than 1,000 fan coil units and 30 individual air conditioning units for public areas are supplied with chilled water from this refrigeration plant.

A cooling tower on the roof,

serving comfort air conditioning and domestic refrigeration, is a double-flow unit having a capacity of 2,250 g.p.m. from 95° to 85° F. Steam for heating and process is supplied by street steam.

(Continued on next page)



DON'T RUN THE RISK OF SMALL MOTOR BURNOUTS!

At an insignificant cost—compared with the "loss" of a motor—motors rated 1 hp or less can be provided with the same reliable overload protection, without which you would not operate larger motors. The Allen-Bradley Bulletin 600 has a built-in thermal breaker which remains accurate and dependable in its overload protection—no matter what the operating conditions may be.

The rugged, snap action switch mechanism of the Bulletin 600 makes "teasing" of contacts impossible—long contact life is assured. Available in general purpose, watertight, and explosion-proof enclosures. All A-B distributors—the control headquarters in your area—carry Bulletin 600 small motor starters in stock. Allen-Bradley Co., 1313 S. First St., Milwaukee 4, Wis. In Canada—Allen-Bradley Canada Ltd., Galt, Ont.



We're Specialists In



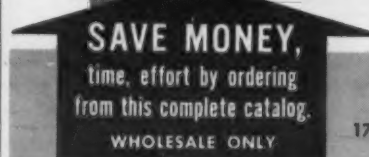
PARTS and SUPPLIES

Over 10,000 items...most complete list in the world...carried in stock! You'll find them all in the NEW Harry Alter Dependabook No. 167 for Fall-Winter, 1957-58.

Write on your letterhead for the DEPENDABOOK

The HARRY ALTER CO., Inc.

Chicago 16, Ill. New York 13, N. Y. Dallas 7, Tex. Atlanta 10, Ga.
1717 S. Wabash Ave. 134 Lafayette St. 122 Parkhouse St. 690 Stewart Ave., S.W.
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG HOUSES



"Summer Shower" COOLING TOWERS

By breaking up both air and water into the smallest units, this lightweight all-metal cooling tower provides maximum efficiency and lengthens the life of the condenser. Inside the stucco-embossed aluminum body, the steel and aluminum is protected by either double-coated baked enamel or baked-on thermal plastic coatings. Resists rust and corrosion! The fan, motor and all plumbing parts are easily accessible for maintenance and the complete weight of this tower is so light it makes installation a cinch! Get the complete story now!

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Silvercraft

Write or Wire for
Name of Nearest Distributor

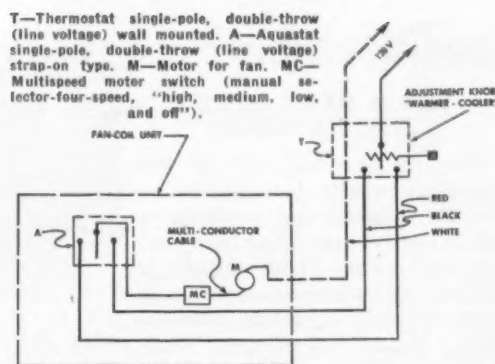
P. O. BOX 107 • LOUISVILLE, KENTUCKY



INDIVIDUAL guest room air conditioning is accomplished with totally recessed American-Standard "Remote-Air" conditioner.



VIEW of typical guest room in Philadelphia Sheraton hotel.



SCHEMATIC drawing of control circuit for maintaining guest room air conditioning to suit taste of individual occupant.

high level smoke exhaust system which is concealed above a plaster perimeter soffit. Each room has its own thermostatic control to insure comfort conditions for the occupants, irrespective of number of persons present or outside conditions.

Kitchen exhaust is accomplished by two American Blower double width fans moving 92,000 c.f.m. in total. Make-up air is supplied by five American Blower air handling units. The exhaust fans are located atop the 22nd floor on the main roof.

GUEST ROOMS

The sixth through 21st floors contain regular guest rooms. The 22nd floor is made up of luxury suites. Each room is provided with a totally recessed American-Standard "Remote-Air" conditioner (Fig. 4).

In the guest room areas, air conditioning zoning is utilized. One section of the rectangular building faces south; the other section faces north. In this portion of the system, the space was divided into two air conditioning zones. Each space has its own thermostat which controls the heating and chilled water temperatures. In addition, each room has its own adjustable thermostatic control to make the climate exactly right (Fig. 5).

Slocum & Fuller, consulting engineers, describe the problems and solutions to the guest room air conditioning in this way:

"When our firm undertook the design of the air conditioning for the guest room areas of the Philadelphia Sheraton, a detailed estimate was prepared for each of the several possible methods and it was shown that the fan coil heating and cooling system was cheaper in first cost at that particular time.

"The building skin is porcelain enameled steel and small louvered openings in the exterior for fresh air intakes to each fan coil unit were ruled out partly because of cost and appearance, but especially because of building height and the resulting wind loading on the building face which made it impossible to predict the volume or direction of air travel through these openings; therefore, the individual units were designed to operate on 100% recirculation of the room air.

"There is a positive exhaust system to ventilate the interior guest room bathrooms. Because the fan coil units operate on 100% recirculation, the ventilation air is supplied through the corridor supply system and by infiltration through the room windows.

"Each fan coil unit is equipped with a concealed four-position, three-speed manual selector

switch (Fig. 6). After installation was completed, this manual switch was set by the contractor to the proper speed for each unit depending upon room orientation and occupancy load.

"From then on, room conditions were maintained automatically, by means of an electric, adjustable 'warmer-cooler,' wall mounted, single-pole, double-throw room thermostat. All elements are line voltage.

"On the cooling cycle, a rise in room temperature causes the fan to run; on the heating cycle, a drop in room temperature actuates the fan (see diagram). The change-over from cycle to cycle is accomplished automatically by a sensing element on the flow water pipe to the guest room unit.

"The finned coil mounted in the top of the unit is used for both heating and cooling. During the cooling season, chilled water from a central refrigeration plant is circulated through mains and risers. During the heating season, these same mains and risers are used to conduct heated water.

"The total installed cost for the complete systems, including guest room and public space air conditioning, central refrigeration plant, and the heating and ventilating of all work spaces was approximately \$1,200 per guest room."

MASTER CONTROL CENTER

The fourth floor is the behind-the-scenes master control center (Concluded on next page)



Here's the answer to your need for low cost automatic temperature control for year-round air conditioning of multiple rooms or areas. J-E "SERIES 500" Solenoid Valves are ideal for hotels, motels, large homes, apartments, offices, etc.

Three-way design enables the thermostat to control the flow of water either through the heat exchanger of the fan coil unit or to by-pass the coil. Pressure build-up is eliminated and there is no water "hammer".

Pilot operation—only two moving parts—low pressure drop—quiet operation—long life. Write today for free bulletin No. 500.

Controls Division
JACKES EVANS MANUFACTURING COMPANY
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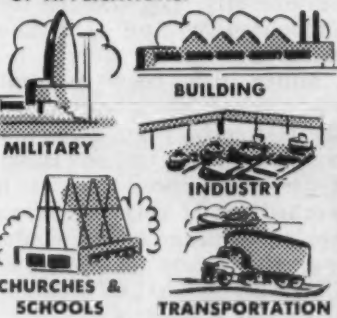
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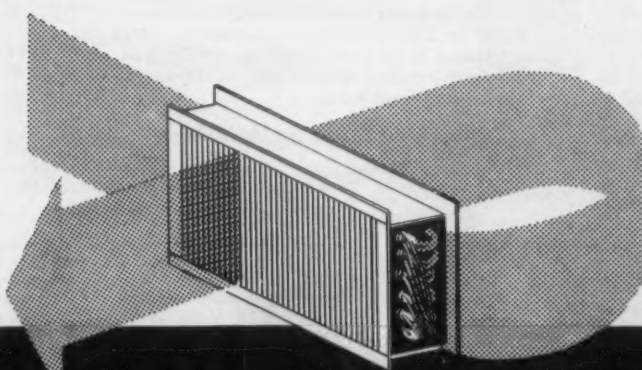
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Let us select the coil you need. Various tube sizes and tube spacings. Any fin spacing required to best suit the application. Production coils for units... central system coils.

Hotel's Built-In Air Conditioning--

(Concluded from preceding page)

for the hotel. In the control area are located transformers, switch-gears, heat exchangers, storage rooms, and the central refrigeration plant.

Pilot lights on each piece of motorized equipment and remote control stop-and-start buttons allow the hotel engineer to tell at a glance whether or not each component part of the system is functioning.

Equipment is automatic to the degree that periodic checks constitute the only attendance required.

The desire for a high standard in the air conditioning system of the Sheraton hotel created a number of interesting problems for John Pryke who is responsible for the design of the system. His solutions are equally interesting.

MUCH HEAT GAIN THROUGH GLASS

One of the features of the Sheraton which contributes to the air conditioning problem is the extensive use of glass on all exterior walls. This entails a critical situation of heat gain unrealistically higher in summer, and a heat loss of near similar proportions during winter months.

In addition, present construction cost put space occupied by air conditioning equipment at a premium since it had to be counted as overhead cost. This situation demanded the right combination of units to occupy the minimum of space and, at the same time, provide high heating/cooling capacity.

One of the space saving solutions worked out by Pryke and his staff is the unique location

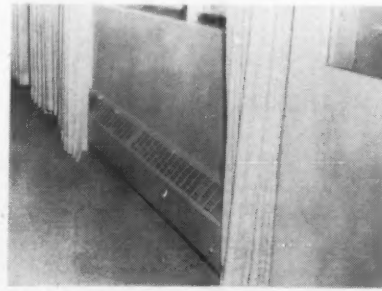


FIG. 7—Hot water fin tube convectors below perimeter glass in large public areas relieve down draft conditions created by cold drop off windows during winter months.

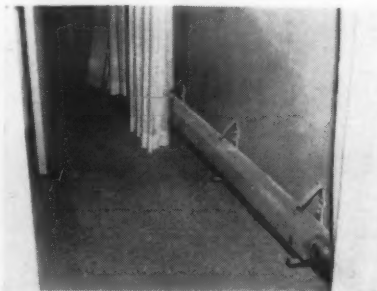


FIG. 8—View of fine tube convector with cover removed.

of the Tonrac refrigerating machines. These huge units are mounted directly on the slab of the fourth floor at the building load center above some of the most valuable function rooms in the hotel.

In these rooms, which are used for meetings, luncheons, and the like, noise level is of prime importance. Despite the imposing size of the Tonrac ma-

chines, operation is said to be so quiet and free of vibration as to be inaudible in any function area.

DOWN DRAFT POSES ANOTHER PROBLEM

Down draft at the perimeter glass during the heating season in the large public areas posed another problem. This was solved through use of hot water fin tube convectors at the perimeter (Figs. 7 and 8). This perimeter system is supplement-

tary to the regular, year-round air conditioning systems for these public spaces.

The entrance, too, required special treatment. Because of the high air change rate, high capacity forced air units had to be used to supplement the lobby air conditioning units.

NEEDS TO MAINTAIN POWER FACTOR

Power factor is always a consideration that must be met by the consulting engineer in any installation. Here is how Pryke explains his solution to the problem in the Philadelphia Sheraton job:

"When the power factor falls below 85%, a penalty is usually imposed by the local utility company. Ordinarily, fractional horsepower motors have poor power factors (25% is not unusual). This difficulty was overcome by using American-Standard room units having a guaranteed minimum power factor of 85%; even at slowest motor speed.

"Considering the 1,000 room units used in the new Philadelphia Sheraton, the higher power factor motors have eliminated the necessity for installing a \$30,000 capacitor bank that would have been required had standard motors been used."

Hammel-Dahl Becomes General Controls Div.

GLENDAL, Calif.—General Controls Co. and Hammel-Dahl Co., industrial control valve manufacturer of Providence, R. I., jointly announced that as of Jan. 2, 1958, the business heretofore conducted by Hammel-Dahl will be operated as a major division of General Controls Co.

William A. Ray, General Controls president, said Hammel-Dahl makes an established line of pneumatically-operated control valves. It will extend General Controls industrial valve line into the high performance field of high pressure and temperature applications for atomic energy and chemical processing and refining, Ray added.

The Hammel-Dahl plant and its 350 employees at Providence will continue operation without interruption in general conformance with the present policies of both companies, the announcement said. Its management will continue under existing executive and managerial officials, with Edward T. Dahl as president of the division and Thomas Ponton as general manager.

Except to comment that the purchase was made with common stock, General Controls did not disclose terms of sale.

Barkow Names Miller To Head Cooling, Freezer Div. Sales

MILWAUKEE—Appointment of Robert R. Miller as sales manager of the Air Conditioning & Freezer Div. of Aug. G. Barkow Mfg. Co., Inc. has been announced by Aug. G. Barkow, president.

Miller has been associated with Frigidaire Sales Corp. for the last seven years in its Commercial Refrigeration, Heating & Air Conditioning Dept. He has worked out of both the Milwaukee and Chicago offices, contacting the trade in Wisconsin, Upper Michigan, and sections of Iowa and Minnesota.

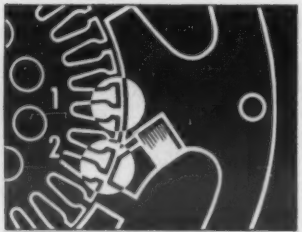
ELECTRIC MOTOR NEWS

New Lightweight Single-Bearing Redmond Motor Warranted Two Years for Customer Satisfaction

HOW TRI-FLUX DESIGN IMPROVES PERFORMANCE BY ADDING A 3rd AREA OF MAGNETIC FLUX



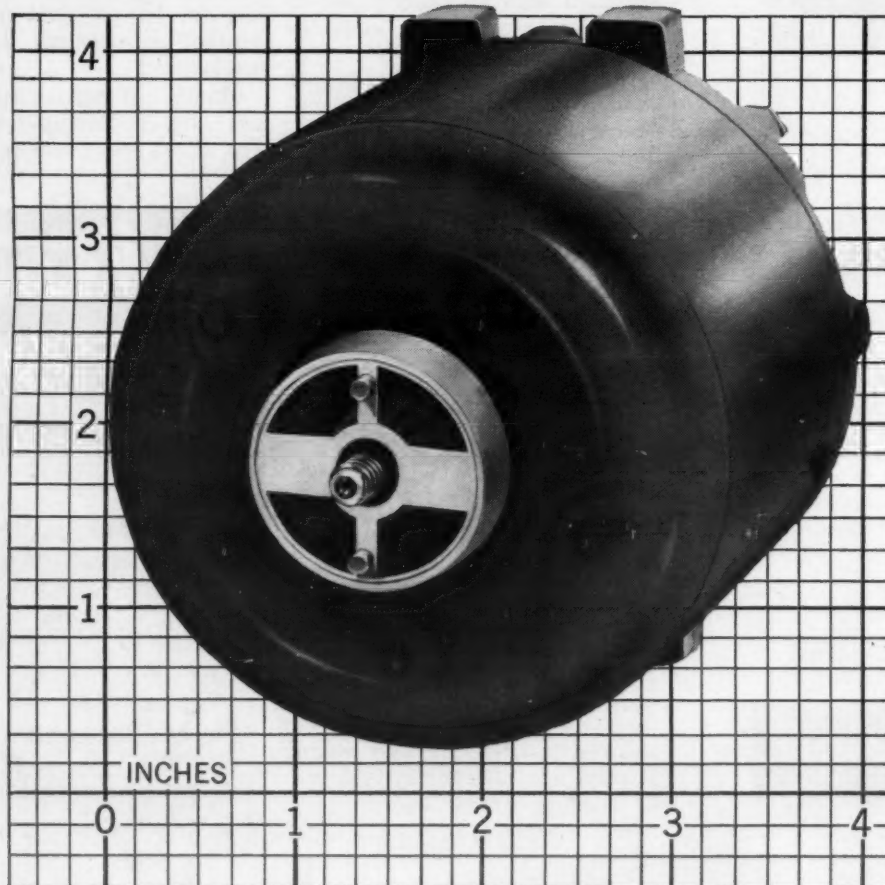
The salient pole single phase induction motor has only one flux path—indicated by the white circle—between the field and the rotor. The motor is not self-starting—for commercial value a starting mechanism must be added.



The second white circle indicates the flux path added by wrapping a shading coil around the trailing pole tip. Power and uni-directional action are increased in this shaded pole induction motor, and it is now self-starting. This motor is now practical at low cost, and is used for applications requiring limited starting torque.



Note that a third flux path has been added at the leading pole tip. This was accomplished by Redmond's Tri-Flux design, whereby a "reluctance notch," which can be seen in the third white circle, is put in the leading pole tip. Efficiency and starting and running torques are greatly increased. New applications are opened to these improved, low-cost motors.



Designed Specifically for the Refrigeration and Air Conditioning Industries and Adaptable for a Wide Variety of Applications

The Redmond AM-4 single-bearing Monomotor is ideal for applications where a long life, quality motor is required. Built to give outstanding performance over years of continuous service-free use, this assurance of customer satisfaction is backed by Redmond's full two-year warranty.

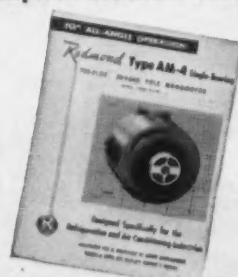
Outstanding features of the new AM-4 are all-angle operation and interchangeability to accommodate all standard brackets and special mounts. Made of a durable lightweight metal, this new single-bearing motor is considerably lighter than conventional models. A new positive oil system is used that is guaranteed not to leak oil in use or in shipment. The extra large oil reservoir is permanently sealed for lifetime lubrication.

Among the many features of the new AM-4 are two that are available only in Redmond small-diameter motors. They are: 1) Patented Tri-Flux design, described in the column to the left, which increases the efficiency and starting and running torques of the AM-4 over conventional single-bearing motors. 2) Uni-Cast construction, which assures a rugged, yet smooth, quiet motor as the stator core frame is precision die cast in one piece, enabling extremely close

tolerances to be maintained during manufacture.

Rated at 1½ through 16 watts, the AM-4 MonoMotor is of 4-pole design, 1550 r.p.m., 115 volts, 60 cycles, and is also available in odd voltages and frequencies.

Descriptive Brochure Available



For the complete story on the new AM-4 motor—dimensions, performance, operational data, and suggested applications—write the Redmond Co., Owosso, Michigan for the "AM-4 Bulletin."

'Radiant Ribbon'**Simple Loop of Black Iron Pipe May Cause Revolution In Hot Water Heating Systems; Installation Costs Seen Cut by Up to 60%**

NEW YORK CITY—A simple loop of black-iron pipe may cause a revolution in hot water heating, says the November *House & Home*, professional magazine of the home building industry.

The simplicity of the new system is claimed to reduce the cost of installing such heating systems as much as 60%, mostly by cutting labor costs.

34 In. Black Iron Pipe

The installation is called a "radiant ribbon," since it consists of a plain 34-in. black-iron pipe around the perimeter of the house carrying 220° water, covered by a simple sheet metal baseboard. At doorways, the pipe drops beneath the door to continue on the other side.

Newest installation of the system is in a National Homes prefabricated house, says *House &*

Home, and the pilot job cost only \$348 installed with an oil-fired boiler, \$308 with a gas-fired unit. Only 12 man-hours of labor were required to install the system—10 hours of plumber labor, 2 hours by carpenters.

Oddly enough, according to commonly recognized heating charts, the system will not give off enough heat for comfort, but in practice a number of successful installations in the Chicago area have been in for over a year, and provide the same comfort as a conventional finned-tube system, even in zero weather, it is reported.

Pipe Heats Wall

The magazine points out that the pipe heats up the wall behind it, which serves to reduce the heat loss of objects in the room and to make persons comfortable. But the wall must be well insulated or this heat just escapes to the outdoors.

So far, the magazine states, the FHA has not approved the system for houses, because the B.t.u. output does not conform to the design tables of the Institute of Boiler & Radiator Manufacturers. But though it falls short in theory, it works in practice, says *House & Home*, and as soon as engineers find out why it works, the systems will undoubtedly be approved.

Emerson-Pryne Organization To Sell Emerson, Pryne, Rittenhouse Products

ST. LOUIS—A new sales organization combining the sales forces of Emerson Electric Mfg. Co. here and its Emerson-Pryne subsidiary of Pomona, Calif., has been announced by Edward L. O'Neill, Emerson vice president and general sales manager.

Emerson - Pryne, formerly Pryne & Co., Inc., a manufacturer of kitchen vent fans, recessed lights, and heaters, was purchased by Emerson Electric last March.

O'Neill said the new sales organization will sell all Emerson merchandise products, all Pryne products, and all Rittenhouse products. It will be directed by Richard B. Loynd, recently named merchandise sales manager of Emerson Electric.

Loynd formerly was assistant to O'Neill in charge of motor sales and merchandise sales training. He succeeds George H. Childers, who resigned to join Mathes Co. in Fort Worth, it was reported.

The new sales force will function under the Emerson-Pryne name, O'Neill said, and will have general offices located in St. Louis. Since the acquisition

of Pryne by Emerson Electric, the Pryne sales force had continued to operate from Pomona.

"This new alignment will provide more concentrated coverage, a stronger organization, and broader opportunity for both company growth and individual advancement," O'Neill said.

In the reorganization, Loynd will be supported by product sales managers at a staff level. O'Neill named Donald J. Harper as manager for all home builder products; Edward K. Handlan for room air conditioners; and Harold Hodges for "Multi-Duty" motors.

Under the new plan, field sales supervision will be provided by five regional managers, who will be under Loynd's supervision but will have full responsibility for their territories and the efforts of salesmen operating in their areas.

Named by Loynd as regional managers were Ben Nadorf, north eastern region; Howard Sample, north central region; John Hayes, central region; Ralph Maynard, southern region; and Phil Pryne, western region.

Official Says,**Holland Furnace Probe Shouldn't Reflect on Reputable Dealers**

COLUMBUS, Ohio—Most established furnace dealers of Columbus are doing a competent job on sales and installations, assistant safety director, William L. Lehman said, in connection with a recent probe of activities of the Holland Furnace Co. He added that the investigation should not reflect on others.

W. Ed Bogen, president of the Heating, Air Conditioning and Sheet Metal Association of Columbus, voiced concern that the probe might put other firms in a bad light.

"As businessmen long established in this city, we certainly are not opposed to any investigation into sharp practices in the furnace business," he said.

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about Santa Clara County

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"Other equally important considerations were good schools and places of worship, progressive government, adequate health services, civic organizations, public-spirited local newspapers, recreational opportunities and suitable housing."

We invite you to contact Sylvania and ask specific questions about this electronic center of the West.

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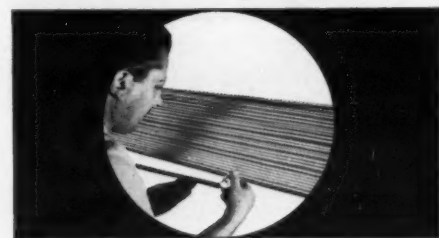
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Columbus Plumbing, Heating Contractors Becomes Mechanical Contractors Assn. of Central Ohio

COLUMBUS, Ohio—The Columbus Association of Plumbing & Heating Contractors has changed its name to the Mechanical Contractors Association of Central Ohio and opened new offices at 1025 W. Third Ave., according to Frank J. Lilly, president.

Lilly recalled that the Master Plumbers Association of Columbus was organized in 1912 and

that due to increased activities of the industry, the name was changed to the Columbus Association of Plumbing & Heating Contractors in 1955.

The newly-named association, it was pointed out, represents allied trades in the mechanical contracting field, including plumbing, heating, refrigeration, air conditioning, ventilation, piping, and sheet metal.

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For more information about products advertised on this page use Information Center, page 59.

BASIC CHEMISTRY

(As Applied In Refrigeration)

Part 1—Hydrocarbons and Oils

By Frank J. Versagi

So much of what happens inside an operating refrigeration system is based on chemistry that the serviceman with a knowledge of chemical fundamentals—as they apply to refrigeration—is a jump ahead of his competition in trouble shooting.

In this article and the ones to follow we will become familiar with some of these chemical fundamentals. We will not follow the logical teaching routine as practiced in schools and colleges for the dual reason that such a practice would introduce a lot of unnecessary information and it would make the subject matter more difficult to follow for those with no previous chemical knowledge.

Instead, we will tie in chemical principles with practical refrigeration. While this method will cause us to skip around a bit, the end result should justify such unorthodox teaching.

Divided Into 2 Classifications

From the beginning, we should be aware of the fact that chemistry is divided into two very broad classifications—organic and inorganic. Both classes

are of interest in refrigeration.

Generally speaking, inorganic or non-organic chemistry is the study of chemicals and substances which contain no carbon, while organic chemistry is the study of compounds containing carbon.

At one time, all the organic chemicals came from plants or animals; it was believed that such compounds could not be created without the life processes of these plants and animals. Hence the term organic.

While it is now known that many of these chemicals can be prepared in the laboratory without any life process at all being involved, the old classification still holds and all compounds of carbon, whether or not they came from living matter, fall into the realm of organic chemistry.

Thus oils, refrigerants, and alcohols are organic compounds. Hydrochloric acid, ammonia, sulfur dioxide are inorganic compounds.

We will begin our study with the simple organic compounds, then tie them in with the materials of refrigeration.

The simplest organic compounds known contain only the elements carbon and hydrogen

and are called *hydrocarbons*. The chemical symbol for carbon is C; that for hydrogen is H. Depending on the amount of carbon and hydrogen present, these simple hydrocarbons can be gases, light liquids, heavy oils, or solids.

For example, the commonly known gas, methane, is the first hydrocarbon. This compound contains one atom of carbon and four of hydrogen in each complete molecule of methane; its chemical formula is CH_4 .

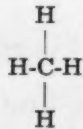
Perhaps we had better explain here that an atom is the smallest chemical particle of an element. A molecule is the smallest combination of two or more atoms to form a different substance. The make-up of methane is an example.

Another one would be the burning of iron in the presence of sulfur. Atoms of the element iron and the element sulfur will combine to form molecules of a new substance containing both, iron sulfide.

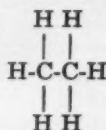
Now back to the hydrocarbons.

Depict Chemical Formulas

To make it easier to visualize chemical changes in organic chemistry, chemists have devised a graphic way of depicting chemical formulas. Thus, the simple methane would be drawn like this:

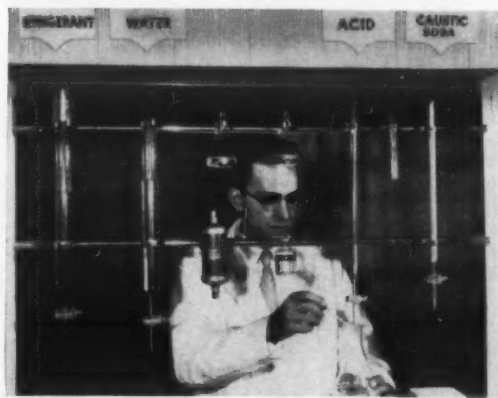


Methane is the first in a series of organic chemicals which is called the methane series or paraffin series. The next compound in the series has two carbon atoms and six hydrogen atoms. It is called ethane and has the formula C_2H_6 . Graphically, it looks like this.



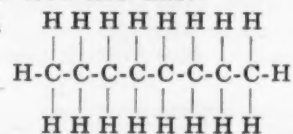
You can easily see that this compound is heavier than methane. Ethane, too, is a gas.

Now, this type of chemical compounds has the ability to



THE chemist can tell us much of what can happen inside a unit. This knowledge helps us to do a better service job.

continue adding carbon and forming a long chain, with hydrogen atoms attached at each end of the chain and above and below each carbon atom. For example, if we imagine a hydrocarbon with eight carbons, it will look like this:



By the time that the compounds get this heavy, however, they are no longer gases, but liquids. Indeed, this eight-carbon compound is octane, that standard for gasoline performance; its formula is C_8H_{18} .

As the chains get longer and more carbon atoms are involved, the liquids become heavier. The gasolines run generally from 5 to 10 carbon atoms; lubricating oils center around 16 carbon atoms. When we get even heavier, we run into petrolatum at about 20 carbons and paraffin wax at about 22 atoms.

Table 1 shows a breakdown of the hydrocarbons which can be separated from regular crude oil and their uses.

Mixtures of Several Compounds

Thus gasolines and lubricating oils are not single chemicals, but are actually a mixture of several compounds, although all are similar except for the number of atoms involved. This is important to keep in mind, for in giving examples of what may occur in refrigeration units or examples of basic reactions, we may pick a single compound like methane to illustrate a typical

reaction. Such a typical reaction is valid for all the hydrocarbons in the series.

With this brief introduction, let's look more closely at lubricating oils which are the simplest class of chemicals with which the refrigeration serviceman will come into contact. It will help us to know just how such lubricating oils are obtained.

(Continued on next page)

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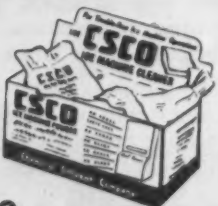
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Table 1—Commercial Products Obtained from Crude Oils

Name	Number Carbon Atoms	Uses
Hydrocarbon Gases	1 to 4	Incompletely burned to form lampblack
Petroleum Ether	5 & 6	Solvent for varnishes
Gasoline	5 to 10	Fuels for engines
Kerosene	10 to 16	Illuminating oil
Lubricating Oils	ranging around 16	Lubrication
Petrolatum	16 to 20	Salves, Ointments
Paraffin	22 to 28	Candles, Waterproof Paper

Chemical Fundamentals--

(Continued from preceding page)

Crude oil as it exists in nature is a mixture of all sorts of hydrocarbons—light gases, light and heavy liquids, and solids. Methane and ethane, both of which we have met, are examples of the gases which occur with the oil.

The medium weight hydrocarbons are liquids under normal conditions. The gasolines, kerosene, and petroleum ether are examples of the lighter liquids; the lubricating oils are examples of the heavier liquids.

The still heavier hydrocarbons form semi-solids and solids like vaseline, paraffin, and asphalt. Which of these solids is predominate in an oil has a great bearing on its suitability for refrigeration.

'Cracking' Oil

When crude oil is distilled and "cracked" under the correct conditions, different fractions or cuts of the basic crude are separated—the gases, light liquids, heavy liquids, solids. These basic groups are then further refined for the end purpose.

In refrigeration we talk of white oils, pale oils, paraffin base oils, and naphthenic oils. Each of the oils is best used under certain service conditions, but before we can understand fully the reasons for the choice of oil, we must become familiar with the actual meaning of each name.

Crude oils as they exist in nature are of two distinct types. Depending on which type of crude is being distilled, the final semi-solid and solid hydrocarbons will either be chiefly wax-like paraffin solids or asphalt solids. Lubricating oils are made of both types of oils—the paraffin-base oils and the asphalt-base oils. These latter are also called naphthenic oils.

Medium-Refined Oils

A pale oil is one which has been medium refined. Generally speaking, the straw colored refrigeration oils are medium refined pale oils.

White oils, without any trace of color, are very highly refined.

At first this may seem like an advantage. Indeed, white oils

are initially very resistant to breakdown. But after some use, they begin to deteriorate so rapidly that their actual service life is shorter than pale oils.

When pale oils break down they do tend to sludge more than white oils. However, the slower rate of breakdown overcomes this disadvantage for when white oils begin their rapid deterioration, their sludges tend to be more sticky and more acidic.

Difference In Oils

Before continuing, we should understand that there is a definite difference between lubrication oils of this type and animal and vegetable oils. In fact, because petroleum crudes are taken from the ground like minerals and ores, oils made from these crudes are called mineral oils.

Unlike mineral oils, animal and vegetable oils are not simple hydrocarbons, but are more complex organic compounds. Animal and vegetable oils react very rapidly with the oxygen in the air to form sticky, varnish-like resins.

As a chemist, I should be ashamed to admit it, but once I forgot this basic distinction between mineral and animal/vegetable oils and oiled my German Luger with olive oil. A couple weeks later, I couldn't pull the slide back because it was so gummed up with tacky goo.

Before mineral oils were generally available, of course, animal and vegetable oils were used extensively for lubrication, but their use for this purpose is now obsolete.

(To Be Continued)

Navy OKs Ansul Moisture Control System In Ships

MARINETTE, Wis. — The U. S. Navy has given official approval for the use of Ansul Chemical Co.'s "Dry-Eye" moisture control system on all refrigeration equipment used on shipboard.

The company said the announcement was made in the June, 1957 issue of *Bureau of Ships Journal*.

The Bureau recommends the use of the Ansul Dry-Eye on all existing equipment and is rewriting its specifications to in-

clude all original equipment for Navy use, Ansul officials state.

J. R. Amore, Refrigeration, Air Conditioning, and Pumps Branch, Bureau of Ships, is quoted by Ansul officials as stating: "an inexpensive moisture indicator that performs reliably and accurately has been made available commercially. The indicator can be used to tell at a glance whether the refrigeration system is in or out of the freeze-up and corrosion range."

Sun Improves Refrigeration Oil

PHILADELPHIA — New, improved "Suniso 3G" refrigeration oil has been announced by Sun Oil Co. It is designed to work well with all modern refrigerants, the company stated. Lower floc point, greater stability, and increased copper-plating resistance of Suniso 3G

permits more efficient operation of compact refrigeration units, the firm claimed.

The oil is distributed to refrigeration servicemen and wholesalers through Virginia Smelting Co. and to equipment manufacturers and industrial users from Sun Oil Co.

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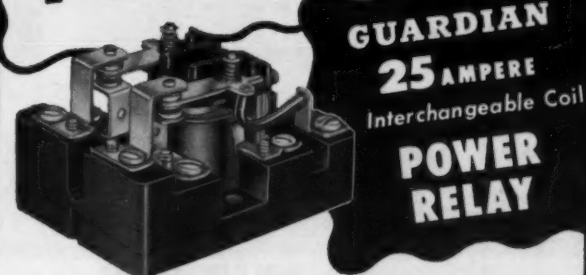
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Air Distribution Requirements In Year-Round Air Conditioning

1. Fundamentals of Conditioned Air

Comfort Zone Living, in mechanically created atmospheres, requires the application of ALL of the engineering principles necessary to create such atmospheres. The term "Air Conditioning" implies much more and involves much more than mere temperature change.

Properly constructed air, suitable for Comfort Zone Living, requires in its construction the application of many complex physical laws plus equipment capable of utilizing them. Thus Air Conditioning should be understood as the science of bringing into balance the Temperature, Humidity, and Composition of an atmosphere suitable

to distribution for the purpose intended.

If intended for distribution into a Comfort Zone for human living, this balance must then be suitable for human occupancy in the area selected regardless of the atmospheric conditions exterior to the area.

While the "construction" of atmospheres is basically the responsibility of the science of air conditioning, getting those atmospheres to the selected area becomes the responsibility of another science—the science of Air Distribution.

Therefore in bringing about suitable mechanically created atmospheres in selected areas

one becomes involved with two sciences: (a) conditioning of the atmosphere by bringing into applicable balance the Temperature, Humidity, and Composition, and (b) distributing the mechanically created atmosphere to the area of selection.

Of these two sciences, that of Air Distribution is possibly most maligned. Unquestionably this circumstance exists because of two reasons: (a) Because too little practical knowledge and principles of application have been translated from the sciences of aerodynamics, thermodynamics, and other applicable branches of physics and chemistry, and (b) because too many applicators involved in air conditioning and distribution refuse to school themselves to the

Frank Klein has been associated with the air conditioning and refrigeration industry for over 20 years. An engineering graduate of the University of Michigan, he has held executive positions with a number of leading manufacturers, and has served as a consultant to both manufacturing and distributing firms, in the heating as well as the cooling field. His series of articles "Selling for Profit in Residential Air Conditioning" was published earlier this year in the NEWS.

This new series of articles is designed, in the author's words, "to offer practical evaluation and test methods for establishing air delivery efficiencies in central year-round air conditioning systems."

fundamentals of these sciences.

This is not to imply that all applicators and designers stop and return to the classroom. Furthermore, this in no way implies the requirement of a college degree for successful design and application. On the other hand the above does bid for recognition of other than lip service to the sciences involved.

Many Sciences Involved

Aerodynamics as a branch of physics is most definitely involved in everyday application and design of air conditioning systems, because it is the science of dealing with forces exerted by air as a gas in motion—actually a group of gases. Thermodynamics as a branch of physics also is most definitely involved because it is the science dealing with the relationship of heat and mechanical energy.

Last but not least chemistry is involved because it is the science of dealing with the characteristics of elements or simple substances, the changes that take place when they combine to form other substances, and the laws of their combination and behavior under varying conditions.

Thus one cannot possibly ignore the fact that the CONDITIONING OF AIR and the DISTRIBUTION OF AIR are separate sciences involving other and inter-related sciences.

There are many of us who style ourselves "air conditioning engineers" who sail under false banners. While our function is such, we are fundamentally incapable of the full impact of the nomenclature. We merely apply the simplification of the sciences involved via the route of equip-

ment and under-simplified information supplied with it by manufacturers. These are complex sciences, this conditioning of air and the distribution of air.

The increasing demand for Comfort Zone Living in the home, plus the development of the highly flexible "add-on" cooling cycle equipment for completing the year-round heating and cooling cycle, increases the demand for intelligent application of equipment and design of systems.

Air Distribution Is Key

The total success of the first science, CONDITIONING OF AIR, if meant for distribution is dependent on the second science DISTRIBUTION OF AIR. Comfort living in a mechanically created atmosphere is of course thought of immediately in terms of temperature.

However, temperature as we generally think of it in so many degrees Fahrenheit is not actually the comfort temperature. Drafty and excessive air deliveries or conversely stale, stagnate atmospheres are functions in part of a temperature. Strong currents of air produced by rate of air movement, temperature, and relative humidity removes more heat from the skin surface than would normally be done, thus they are usually associated with a feeling of being cool.

Stale air, devoid of movement causes less than normal heat removal from the skin surface, than that given off by body function and as a result the feeling is usually one of stuffiness.

Thus stale, stagnate air or
(Continued on next page)

How Activated Charcoal Keeps Veterinary Hospital From Going to the Dogs



Air conditioning contractors faced a special problem in this southern Ohio veterinary clinic: How to keep strong kennel room odors (top photo) from being recirculated into the modernistic waiting room (bottom).

To be economical, recirculation was indicated. However, it was impossible as long as the odor problem remained. The solution was a heavy duty activated charcoal filter. When recirculated thru this filter, odor-laden air becomes fresh and clean again—one more example of why true air conditioning must include activated charcoal air purification, the only practical and proven method.

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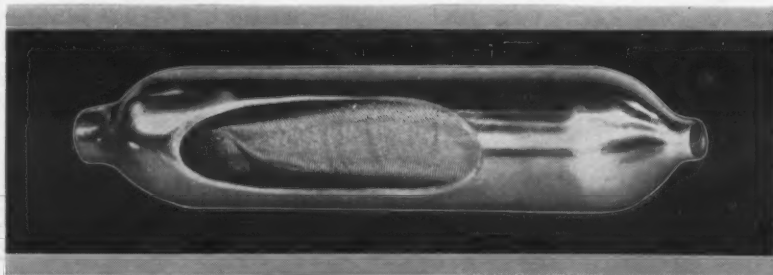
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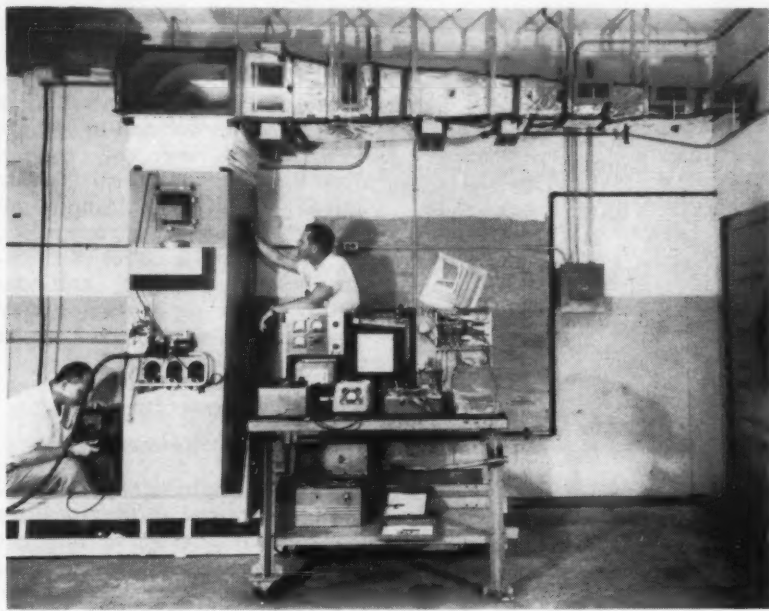
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TYPICAL evaluation of the effect of air psychrometry on year-round equipment and systems in the testing and developing laboratories of The Folsom Co., Dallas, Texas, manufacturer of residential systems.

Fundamentals of Conditioned Air--

(Continued from preceding page)

tern of design. When occupied, a vacant house becomes a "home" for its occupants. Two houses built exactly alike, when converted to homes for two separate families can widely vary in the requirements for a mechanically created indoor atmosphere for year-round comfort zone living.

Composition of Air

Thus a careful application of Air Psychrometry must be practiced in conditioning the atmosphere, later to be distributed within the selected space. Since the first step in designing a year-round system for comfort zone application involves the primary science of CONDITIONING the air, our first course will be to establish the basic fundamentals relating to the composition of air and the application of Air Psychrometry.

The air we breathe, regardless of its condition at the time, is a mixture of some chemical balance; constructed mainly of nitrogen and oxygen, it also contains in varying amounts, other elements such as argon, carbon dioxide, hydrogen, xenon, krypton, and other gases.

Most important of all to chemical and physical balance and their relationship to the Effective Temperature is the amount of water vapor. At normal temperatures atmospheric air contains about 4.0% water vapor

on a weight basis. Suspended dust particles must be included in the entire composition.

To understand the normal composition balance of air required for a human Comfort Zone, one must understand its psychrometry.

Dry Air is a term more used as a reference point when establishing standards of air movement. Because air moving equipment such as fans and blowers are immediately affected by the weight relationship of the air they are required to move, expressions for air delivery of such equipment is most always expressed in terms of f.p.m. and c.f.m. of "Dry Air."

The term however is inapplicable to practical application since water vapor to some degree is always present in all atmospheres. For example some idea of the water vapor relationship in atmospheres at varying dry and wet-bulb temperatures can be seen in the following:

Table 1

Example A: 95° DB—75° WB	
B.t.u./lb. T.H.	37.81
Relative Humidity	38.0 %
Dewpoint	66.0 °F.
Grains Moisture/lb.	95.9
Grains Moisture/Cu. Ft.	7.1
Cu. Ft./lb.	14.29
Example B: 95° DB—76° WB	
B.t.u./lb. T.H.	38.73
Relative Humidity	42.0 %
Dewpoint	67.75 °F.
Grains Moisture/lb.	102.1
Grains Moisture/Cu. Ft.	7.75
Cu. Ft./lb.	14.32
Example C: 95° DB—77° WB	
B.t.u./lb. T.H.	39.67
Relative Humidity	44.0 %
Dewpoint	69.5 °F.
Grains Moisture/lb.	108.5
Grains Moisture/Cu. Ft.	7.95
Cu. Ft./lb.	14.34
Example D: 95° DB—78° WB	
B.t.u./lb. T.H.	40.64
Relative Humidity	46.0 %
Dewpoint	71.0 °F.
Grains Moisture/lb.	114.4
Grains Moisture/Cu. Ft.	8.3
Cu. Ft./lb.	14.36
Example E: 95° DB—79° WB	
B.t.u./lb. T.H.	41.63
Relative Humidity	49.0 %
Dewpoint	73.0 °F.
Grains Moisture/lb.	122.6
Grains Moisture/Cu. Ft.	8.8
Cu. Ft./lb.	14.38

By comparing these examples the specific relationship of water vapor in the air to heat is obvious; however, the relationship is to *wet bulb* temperature. Note that the *dry bulb* temperature of 95° F. remains constant in all examples. Thus the Effective Temperature balance is in direct ratio, in composition, to the *wet bulb* temperature.

Reference was made to the "weight" of air in the previous paragraph. By referring to the examples in Table 1 the varying ratio of weights can be seen. Thus *weight* and *volume* of air is in direct ratio to temperature. More about volume relationship will be discussed later.

2 Kinds of Heat

Heat as we know it results from the vibration bombardment of the molecular structure of a substance under given conditions. We use the British Thermal Unit or B.t.u. as a yard-

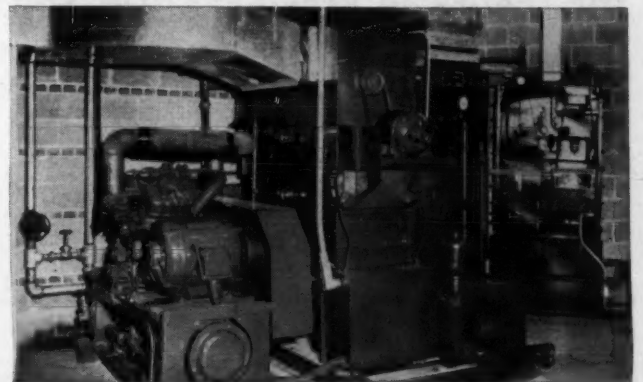
stick for unit measurement. In brief, it is the quantity of heat necessary to raise the temperature of 1 lb. of water, 1° Fahrenheit. There are, however, two types of heat with which the system designer is concerned:

(a) Sensible Heat, which is the type of heat which can be transferred from one body or substance to another and in so doing establishes the temperature of the body or substance. This type of heat is the one which manifests itself to the sense of feeling.

(b) Latent Heat is the type that at given pressures can change the physical state of a substance. This is accomplished under Latent Heat without changing the temperature of the substance itself.

Refer once again to Table 1, where the *wet bulb* influenced a change, by varying moisture (Continued on next page)

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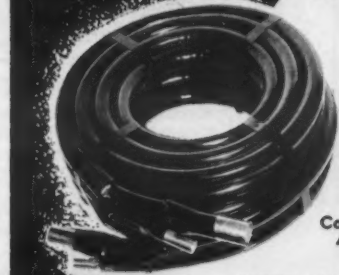
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Air Distribution --

(Continued from preceding page) contents of the atmospheres given, yet in no way affected the dry bulb temperature. For examples of varying Latent Heat in atmospheres at the same dry bulb temperature refer to Table 2.

Latent Heat Ratio

From these examples one can see that the Latent Heat at the same dry bulb temperature is in direct ratio to the wet bulb temperature.

However, as the dry bulb temperature raises the ratio is influenced for the same given wet bulb temperature.

Total heat is the factor with which the system designer is concerned. This heat is a combination of both the Sensible Heat and the Latent Heat content of an atmosphere. An atmosphere containing water

vapor is generally referred to as an "air-steam" composition.

2 Things Designer Is Concerned with

The designer of the year-round system is concerned with both the removal of heat from this composition in the cooling cycle and the adding of heat to this mixture in the heating cycle.

The Total Heat quantity in an air-steam mixture is most generally referred to as *enthalpy*. Enthalpy is made up of the heat necessary to raise the temperature of dry air from a base-point to a given temperature; the necessary heat to raise the temperature of the water vapor to a temperature of evaporation; the heat necessary to evaporate the water and the heat necessary to raise the temperature of the steam to a given temperature.

Example A: Dry Bulb Temperature 95° F.

Wet Bulb Temperature:	71°F.	73°F.	75°F.	78°F.	80°F.
% Latent Heat	40%	56%	66%	75%	79%

Example B: Dry Bulb Temperature 100° F.

Wet Bulb Temperature:	71°F.	73°F.	75°F.	78°F.	80°F.
% Latent Heat		12%	33%	50%	59%

How To Figure Enthalpy

The Enthalpy of such an air-steam composition can be calculated by the following formulation:

$$Th = .24t + Wm(1,060 + .45t)$$

Th represents Enthalpy.

.24 is the specific heat of Dry Air.

Wm is the weight of moisture in pounds per pound of dry air. t is the Dry Bulb Temperature.

In this example formulae the (1,060 + .45t) includes the Heat of Liquid. Thus the Sigma Function at saturation is

$$\Sigma = .24t + Wm[1,060 + .45t - (t - 32)]$$

Sigma in this case is the heat in B.t.u. per pound of dry air. The difference between the Sigma Function and the Enthalpy or Total Heat per pound numerically amounts at saturation to 0 at 32° F., .3 B.t.u. at 62° F., .7 B.t.u. at 75° F., and 2.8 B.t.u. at 100° F.

Volumetric changes of atmospheres as influenced by temperature and pressure is still another factor with which the designer of systems is concerned. Air expands as it is heated. In either heating or cooling cycle the volume of a given amount of air to be handled varies in direct ratio to the change in its temperature and pressure.

Air Has Definite Weight

Air has a definite weight per cubic foot of area occupied. This changes for instance with the temperature for one thing; the rate of change is usually measured from a reference point of the volume occupied by 1 lb. of air at 0° F.

For every degree rise in temperature the volume of the air increases by 1/460 of its volume at 0° F.

Air at 100° F. possesses a volume of 100/460 or 21.7%

Table 2

greater than it would have at 0° F.

Conversely the same air would have less volume as the temperature was lowered below 100° F.

Under constant pressure volumetric changes of air can be expressed in the following formulation:

$$(1) \frac{V_2}{V_1} = \frac{T_2}{T_1}$$

$$(2) V_2 = V_1 \frac{T_2}{T_1}$$

V₁ represents the initial volume of the air.

V₂ represents the ultimate volume of the air.

T₁ represents the initial absolute temperature (the temperature as measured above absolute zero) of the air.

T₂ represents the ultimate absolute temperature of the air.

The information given here thus far is meant to emphasize not only the effect of air composition as a suitably balanced mixture for comfort zone atmospheres, as related to sensory perception, but to initiate a recognition of composition and its effect on transporting equipment and systems.

Psychrometric Properties

Produced by 'Conditioning'

The psychrometric properties of air in year-round systems as produced by the "conditioning" processes has everything and anything to do with the second science of distribution and on the equipment by which distribution is accomplished.

The basic fundamentals discussed thus far of (1) chemical balance, (2) weight, and (3) enthalpy are but a few of the direct effects on transporting equipment in systems such as blowers, ducts, outlets, etc.

A typical example of the prac-

tical evaluation of the variations in these effects can be seen in Fig. 1. Here a typical forced warm air furnace, containing a direct expansion coil-in-plenum arrangement for the cooling cycle is being discharged under actual conditions through an ASHAE-NAFM standardized duct system. The effect of chemical balance, weight, and enthalpy are being evaluated here on the basis of their effect on the blower equipment.

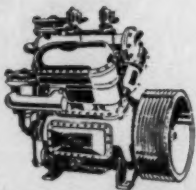
'Changes Have Direct Effect on Blower'

As the physical balances change, external static pressures change, with resulting changes in r.p.m. of the blower. These changes have a direct effect on the ability of the direct drive blower being used to maintain suitable power and current at constant voltages.

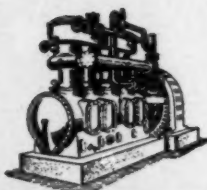
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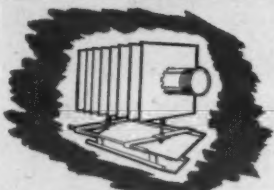
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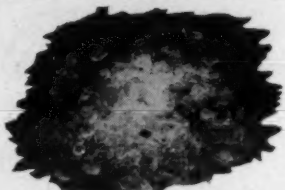
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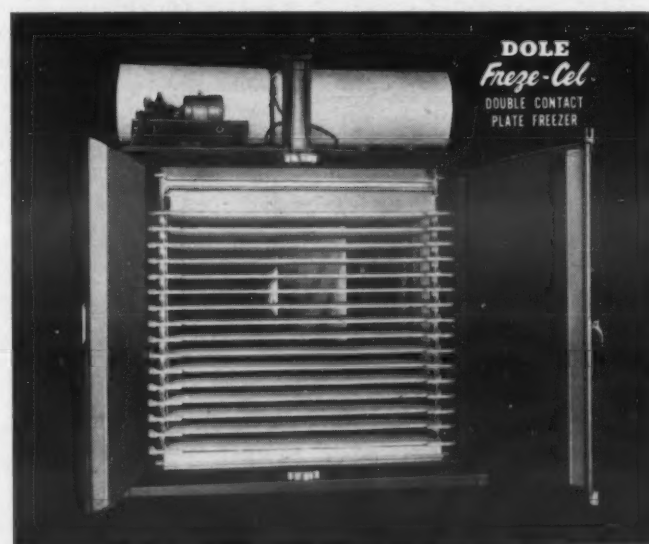
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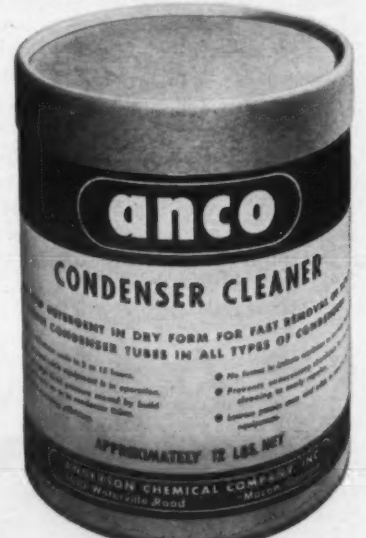
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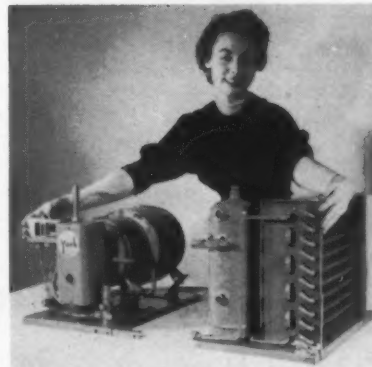


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SEATED atop the condensing unit of a new "Yorkaire Champion" residential central air conditioning system, this young woman makes a "cool package." Unit shown can be installed outside the home. Both air and water-cooled models are available in 2, 3, 5, and 7 1/2-hp. sizes.

SWITCHABLE 1958 York hermetic condensing units for supermarket and other commercial use features easily separated and changeable components. This compressor can be fitted to the air-cooled condenser at right or a water-cooled condenser section. New units are available in nine models, 1/3 to 7 1/2 hp.



in two-tone grey with a golden grille and control center panel. Rotating air grille with its slanted louver bands permits multi-directional air cooling. The Power-Mite features two cooling speeds, automatic temperature control, and outside discharge of room air.

A new "snap-in" kit makes installation a matter of minutes without use of tools.

Only slightly larger than the (Concluded on Page 81, Col. 3)

York Introduces '58 Conditioning, Condensing Units--

(Continued from Page 1)

and condenser now can be separated easily for repair, replacement, or for substitution of components, York officials declared.

The same compressor section may be fitted to an air-cooled, water-cooled, or combination air and water-cooled condenser section.

No Need To Sever Permanent Lines

This development, which permits replacement of condenser or compressor without need to sever permanent lines or re-braze, will reduce considerably inventories carried by refrigeration service dealers, company officials said.

Compressor sections and condenser sections can be interchanged to make a number of different models instantly available from a few stock units, they added.

May Install Condenser Away from Compressor

In the new Flex-O-Metics, the condenser section may be installed remotely from the compressor section. The compressor section is wired completely for use on racks.

The new hermetic condensing units are available in nine

models ranging from 1/3 to 7 1/2 hp. They operate with either Refrigerant-12 or Refrigerant-22.

All very low temperature models feature York's "Tri-Cooling" principle which enables condensing units to attain temperatures as low as -50° F.

On air-cooled models, the compressor shell is refrigerant cooled.

Robert E. Cassatt, sales manager of packaged products, introduced the new compact and powerful room air conditioners. He said that technical advances, such as new design of compressors, cooling coils, and tubes, has enabled the company to produce the most efficient, yet smallest room air conditioners ever marketed by York.

Outlines 4 Room Units

Cassatt described four lines of room air conditioners incorporating nine models in sizes ranging from 3/4 hp. to 2 hp.

The Power-Mite line contains a Custom and Supreme model operating at 115 volts, 7 1/2 amps and a Custom model on 230 volts. All three are of 1-hp. capacity.

Measuring 22 in. wide, 14 in. high, and 14 1/8 in. deep, it is small enough to handle and

Be Sure To See True's Complete Line of Beverage Coolers In Booth 172



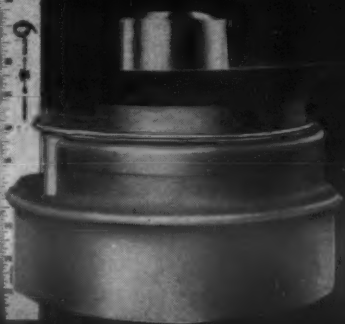
Model TIA-623 Ice Cube Maker Cooler

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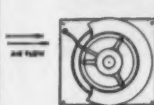
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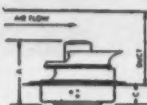
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TOP VIEW



SIDE VIEW



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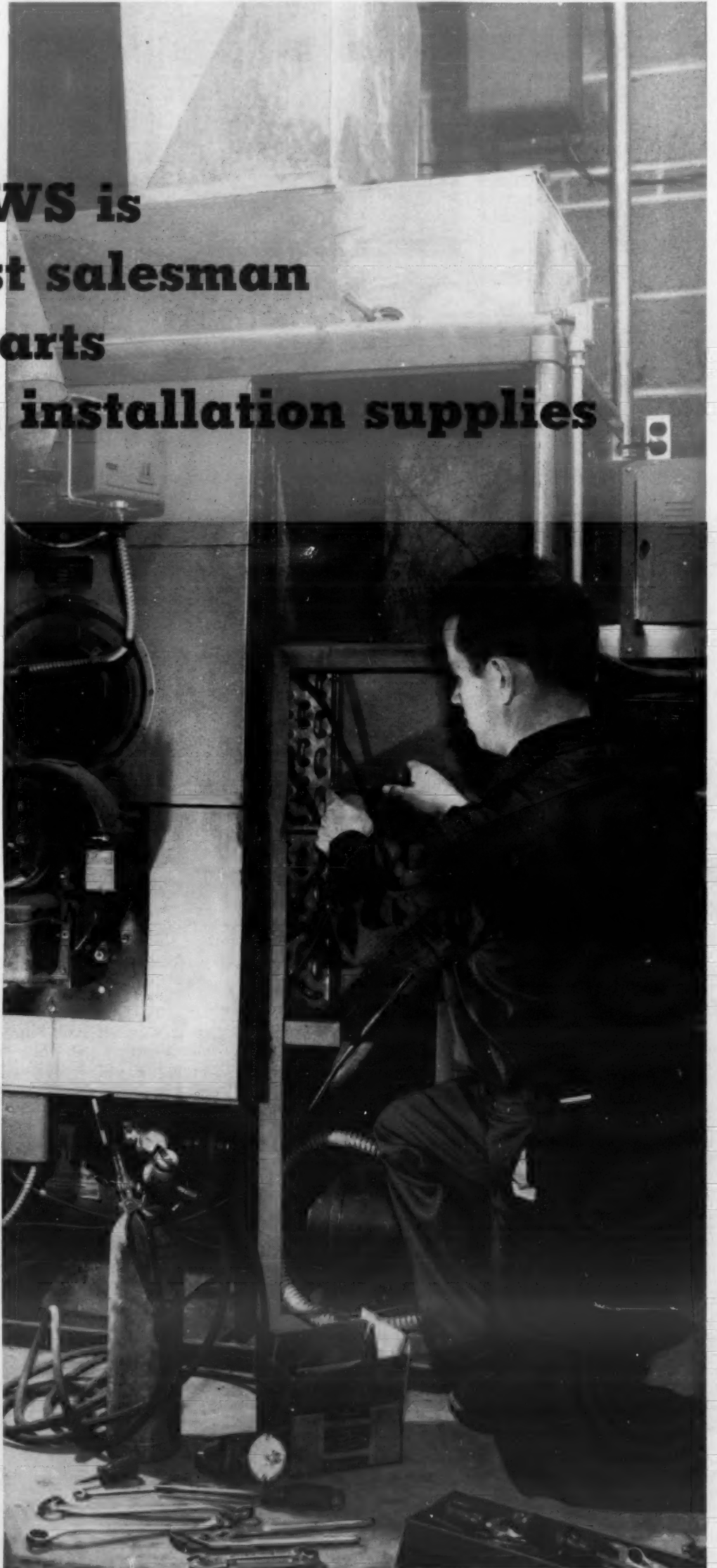
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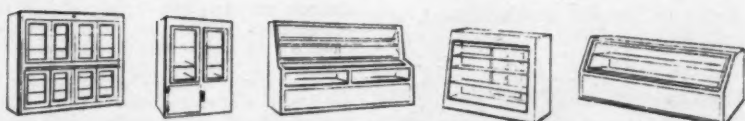
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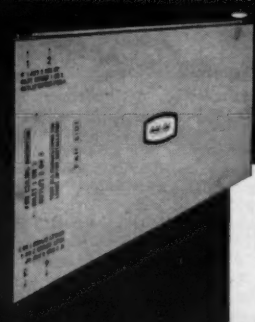
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Cold-Cel TRUCK
PLATES



York Offers New Units - -

(Concluded from Page 79)

Power Mite is York's "Compressomatic Supreme" which is claimed to be 40% smaller and 30% more efficient than conventional room units of a year ago. Efficiency is boosted by maze coil construction, staggered tubes, and rippled aluminum fins, while size is reduced to 24½ in. wide, 14 in. high, and 17 in. deep.

Styled in gold and grey, the Compressomatic Supreme has a 215-sq. in. filter and "Clean Air Sentry" that flashes a red light when the filter needs changing.

This model has two cooling speeds, automatic temperature control, discharge vent, and "Duo-Cycle" starting which prevents "shock overload" of the electrical system caused by full load starting.

Other features include new grille design, patented "Hydro-Lift" to increase cooling capacity and prevent sweating and dripping, five-year protection plan on entire refrigerant system, and York hermetic compressor with micro-fitted piston rings.

'Senior' Series Room Units for Multi-Space Air Conditioning

York also presented a new "Senior" series room air conditioner with a 1½-hp. Supreme model, a 2-hp. Custom model, and a 2-hp. Supreme model.

Designed for multi-space conditioning, the Senior series also features compactness combined with increased efficiency.

The 1½-hp. Senior Supreme operate on 115-volt, 12-amp. current, an innovation in room air conditioning. The Senior Custom 2-hp. unit is designed for large area cooling. Both the Custom and Supreme 2-hp. units include maze coils, Hydro-Lift, 225-sq. in. filter, and flush inside fit.

The Senior Supreme models are distinguished by a golden grille and control panel door style treatment plus a difference in B.t.u. capacities. Dimensions of the Senior series are 17½ in. high, 24½ wide, and 25½ in. deep.

Continuing in York's line are the Snorkel units of ¾ hp. and 1 hp. All the Snorkels are available in aluminum grey, metropolitan grey, and provincial wood grain.

The Snorkel series is engineered to use a minimum of window space to overcome building code restrictions which forbid the installation of room air

conditioners beyond the window ledge.

Fitting against the wall below the window, the Snorkel unit requires but 9 in. above the sill. It is adaptable to either heating or cooling.

The new York residential central air conditioning systems include the "Pathfinder" self-contained air-cooled unit for minimum space installation, the "Hi-Ef Twinline" with two complete cooling circuits, and the "Champion" remote units in either air-cooled or water-cooled types.

Have Residential Units In Three Sizes

Pathfinders are available in 1¾, 2, and 3½-hp. sizes. Packed in a weatherproof steel case and featuring York cooling maze coils, it is adapted to warm air systems by utilizing existing ductwork. Separate ductwork is provided where heating is by steam or hot water.

Hi-Ef Twinlines, available in 2 and 3-hp. sizes, are said to make starting easier, cut operating costs, and adapt quickly to weather changes through the use of two compressors.

Champion units are available in four sizes, 2, 3, 5, and 7½ hp., either air or water cooled.

For commercial applications, York offers the water-cooled "Embassy" line in six sizes from 3 to 22½ hp. The Embassy features an exclusive "V" coil which assures maximum contact of air with cooling surfaces and makes possible a proper balance between temperature and humidity, York officials said.

A "Yorkaire Special Series" includes self-contained units for specialized cooling needs in commercial and some residential installations. They range in size from 1 to 15 hp.

Claimed To Save Space

When used with a compact centrifugal blower accessory, they make up a complete space-saving system. They are adapted for adding cooling to existing forced warm air, hot water, or steam heating systems.

Furnaces Available In 3 Series

York oil and gas-fired furnaces are available in three series. The "Climaster" adapts easily to cooling for year-round air conditioning. The "Patrician" combines heating and cooling in one package. The "Challenger" provides economi-

cal installation and operation.

Oil furnaces include horizontal, upflow, counterflow, and basement types. Gas furnaces are made in upflow and counterflow types.

Oil-fired features include atomizing burner, over-sized blower and motor, and large filters.

Gas-fired furnaces have rigid cast iron burners for non-clogging quick ignition and filters.

Offers New Ice Makers

The new automatic York commercial ice makers are capable of producing many types of ice shapes from king size crescents to wafer thin pieces at the turn of the ice selector dial.

Ice selector models will produce from 200 to 450 lbs. per day. They are available in air-cooled and water-cooled units.

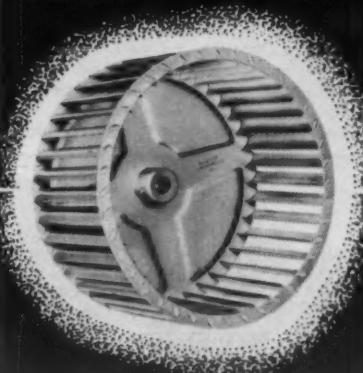
Six other York models, three air-cooled and three water-cooled types, produce from 300 to 8,000 lbs. of ice flakes a day.

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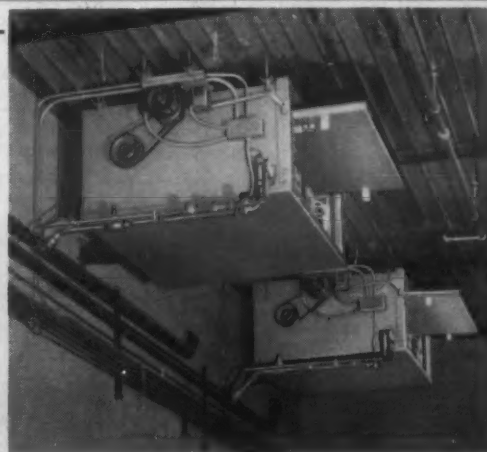
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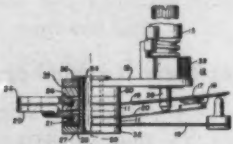


Partial view of six Krack coolers
installed by York Louisville Co.

PATENTS

Week of September 17
(Continued)

2,806,923. THERMOSTAT. Howard W. Bletz, Lexington, Ohio, assignor to Stevens Mfg. Co., Inc., a corporation of Ohio.



1. A thermostat comprising, a base, a bimetallic element, an insulator spacer mutually insulating said base and bimetallic element, clamping means acting on said base, element and spacer to clamp same together in a stack, a first circular bearing surface adjacent the outer periphery of said spacer, a first recess on one side of said spacer inboard of said bearing surface, a second circular bearing surface generally axially opposite said first bearing surface to also lie adjacent to the outer periphery of said spacer, a second recess on the opposite side of said bushing of substantially equal diameter as the first recess, and said first and second bearing surfaces lying in substantially parallel planes, whereby said clamping means exerts an axial pressure on said stack which is borne by said first and second bearing surfaces rather than at the recesses of said spacer to thereby establish a definite free length of bimetallic element.

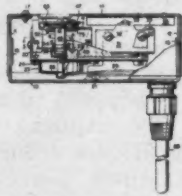
2,806,924. CONTROL DEVICE. Elwyn H. Olson, St. Paul, Minn., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

1. A control device comprising, a frame, condition responsive means carried by said frame, control means carried by said frame, a mechanical

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25c each, while designs are furnished at 10c each. Address orders to: Commissioner of Patents, Washington 25, D. C.

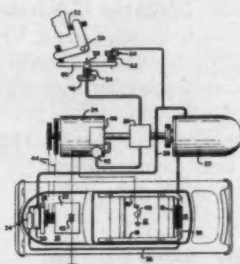
linkage operating said control means in response to said condition responsive means, said mechanical linkage including a rod axially positioned by said condition responsive means, a



dial carried by the end of said rod opposite said condition responsive means, rotation of said dial also rotating said rod and changing the control point of said control device, cooperating indicia on said dial and on said frame exhibiting condition value in accordance with the rotative position of said rod, a member normally engaging said dial, spring means biasing said member toward said dial, a plurality of notches in an arcuate portion of said member, an abutment on the back of said dial disposed to cooperate with any one of said plurality of notches on said member and restrict pivotal movement of said member relative to said dial, and cooperating abutments on said member and said frame limiting rotation of said dial.

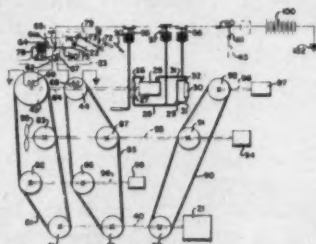
erant, an evaporator connected to the receiver, a condenser connected to the receiver, a compressor having its high side connected to the condenser and its low side connected to the evaporator during the refrigeration cycle to circulate refrigerant from the compressor to the condenser, to the receiver, to the evaporator and return to the compressor, valve means for connecting the low side of the compressor to the condenser and the high side of the compressor to the evaporator during the heating cycle, said receiver connected to the evaporator through a heat exchanger during the heating cycle, said heat exchanger conducting the refrigerant in indirect heat exchange relationship with a heat bearing substance other than the refrigerant to transmit heat to the refrigerant to pressurize the receiver and drive liquid refrigerant from the receiver to the condenser where it is evaporated, and means responsive to a condition of the gaseous refrigerant generated by the condenser and on the suction side of the compressor for regulating heat transfer in said heat exchanger to regulate the rate at which refrigerant is supplied to the condenser.

2,807,146. VEHICLE REFRIGERATING APPARATUS. George W. Jackson, Dayton, Ohio, assignor to General Motors Corp., Detroit.



5. In combination with a vehicle having wheels and an engine connectable to the wheels for propelling the vehicle and having a passenger compartment to be conditioned; a refrigerating system including a compressor, a condenser, and an evaporator connected in refrigerant flow relationship; means for circulating air to be conditioned for said passenger compartment in thermal exchange relationship with said evaporator; power transmitting means connecting said compressor to said engine; means including a throttle for varying the speed of said engine to vary the speed of the vehicle; said last named means including means providing a minimum throttle opening for idling with a disconnected compressor and means operable coincidentally with the operative connection of said power transmitting means for increasing the minimum opening of the throttle means to maintain the necessary idling speed when the compressor is connected to said engine.

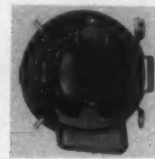
2,807,147. VEHICLE REFRIGERATING APPARATUS. James W. Jacobs, Dayton, Ohio, assignor to General Motors Corp., Detroit.



1. In combination: a vehicle, an engine driving said vehicle; a vehicle space to be cooled on said vehicle; a refrigerating system on said vehicle and including a compressor, condenser and evaporator in refrigerant flow relationship, with said evaporator cooling said vehicle space; compressor driving means between said engine and said compressor; a multiple speed ratio drive clutch on said compressor driving means; a throttle controlling said engine; a manifold on said engine; and means responsive to different combined relationships of conditions of said throttle and conditions in said manifold selectively causing different speed ratio drives in said clutch.

(To Be Continued)

Tecumseh Adds Twin-Cylinder, 'Pancake' Models



TWO new compressors, "pancake" design and twin-cylinder, have been introduced by Tecumseh.

TECUMSEH, Mich. — Several new models, some of a type which the company has not hitherto produced, have been added to the Tecumseh Products Co. line of refrigeration compressors for air conditioning applications.

Model AR-26 is perhaps the most noteworthy addition to the line. It incorporates the well-known "pancake" design, widely used in compressors for household refrigerators and freezers, into a unit for air conditioning applications.

It is a 1/2-hp. Refrigerant-12 model rated at 5,150 B.t.u. It is under 10 1/2 in. high, less than 11 in. wide, and less than 6 1/2 in. deep.

In the single-cylinder internal spring mount models size has been reduced and all compressors incorporate high power factor motors, say Tecumseh officials. All use Refrigerant-22 and and some of the more popular models use permanent split-capacitor motors to permit savings on auxiliary equipment.

New models in this series include the S8N16, a 1-hp., 115-volt, 7 1/2-amp. model rated at 7,700 B.t.u., and using a permanent split-capacitor motor. Model S1T16 is a 1-hp. model which will operate on either 115-volt, 12-amp., or 208 or 230-volt current, and is rated at 9,580 B.t.u.

There are 10 twin-cylinder air conditioning compressors in the Tecumseh line, covering the 1, 1 1/2, and 2-hp. range. All the twins except the 50-cycle models use PSC motors, all are designed for Refrigerant-22, and all are externally spring mounted.

New models in this series include the B8513, a 1-hp., 115-volt, 7 1/2-amp. model rated at 8,400 B.t.u.; the B1516, a 1-hp., 208-230-volt model rated at 13,400 B.t.u.; and the B21T18 2-hp., 208-30-volt model rated at 16,250 B.t.u.

Also new in this series are two 50-cycle, 230-volt models, the B1616 1-hp. model rated at 11,700 B.t.u., and the B32T16 1 1/2-hp. model rated at 16,250 B.t.u.

One new model for regular applications, and three new heat pump models have been added to the series that embraces the 2, 3, and 5-hp. twin and four-cylinder compressors for air conditioning applications.

Model FB300 is a 3-hp., 4-cylinder Refrigerant-12 model rated at 37,500 B.t.u. Three new models for heat pump application (all using Refrigerant-22) are model PJG300, 3-hp., 2-cylinder rated at 32,500 B.t.u.; model PJE300, 3-hp., 4 cylinder, rated at 37,500 B.t.u.; and PFB500, a 5-hp., 4-cylinder model rated at 66,000 B.t.u.

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TO REPRESENT national manufacturer of commercial refrigeration. In the New England territory. Have had seven years' experience selling commercial refrigeration, specializing in the market field. BOX A5909, Air Conditioning & Refrigeration News.

MANAGEMENT POSITION wanted—Serviceman working 20 years on commercial and domestic refrigeration and air conditioning for nationally advertised equipment. Holding present job for many years, cannot advance. Wide knowledge will assist improving your business. Excellent salesman and customer relation man and trouble shooter. BOX A5910, Air Conditioning & Refrigeration News.

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AIR CONDITIONING sales engineer. Exclusive Carrier distributors in Connecticut need alert, enthusiastic man with knowledge of air conditioning and executive ability to work with and train dealers. Excellent opportunity. CONNECTICUT AIR CONDITIONING CO., 50 Fitch St., New Haven, Connecticut.

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MANUFACTURERS' REPRESENTATIVES. Southwest and some other territories available for established line of Chenco products. Complete line of liquid and dry scale removers, liquid and dry algaecides and water treatments. Contact CHEMICAL ENGINEERING CO., INC., P. O. Box 1076, Dallas, Texas.

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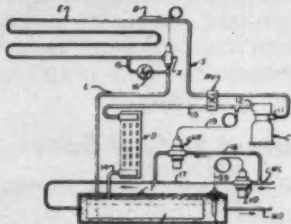
ATTENTION SERVICEMEN: Send for free circulars and bulletins on refrigeration parts and equipment. Real money saving values: WALTER W. STARR, 2833 Lincoln Avenue, Chicago 13, Illinois.

SALES REPRESENTATIVES

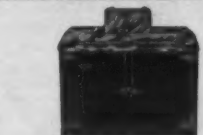
This advertisement is directed to sales representatives who are truly worthy of the name, SALESMAN. If you consider that title an honorable one then you are the man we are looking for. The new Ace Cabinet Corporation has a few desirable territories still open. You can obtain complete details in person at our booth at the Refrigeration Show, November 18 to 21, in Chicago. At that time you will see the most complete line of Automatic Defrost Open Top Display Cases, Counter-top Angle Vision Frozen Food and Ice Cream Cabinets, Milk and Beverage Display Cases, Wall Cases, Reserve Storage Freezers. For complete information on the Ace Cabinet Corporation line that will set the pace for '58 visit our booth at the show, and ask to see Ed Stern, President.

Week of Sept. 24

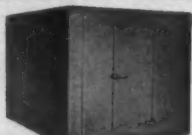
2,807,145. APPARATUS FOR SUPPLYING HEAT FOR HOT GAS DEFROSTING SYSTEMS. Ray M. Henderson, Bellaire, Texas.



1. A reverse cycle refrigeration system comprising, a receiver for refrigerant,



Direct Draw Refrigerated Faucets



Metal Walk-In Cooler



Cubemaker



Upright Low Temperature Freezer



Reach-In Cooler



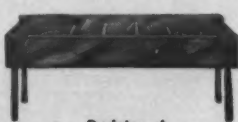
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Servicing Automobile Air Conditioners

(Vol. 2)

BY C. DALE MERICLE

The Vornado unit is the tenth make to be discussed in the current series on automobile air conditioners. Makes previously described in this series were A.R.A., Artic-Kar, Frigette, Frigikar, Kauffman, Mark IV, Airtemp, Mobilette, and Novi. Other makes by "independent" manufacturers will be described in future instalments, following which units of most automobile manufacturers themselves will be described.

Models discussed in the current series are 1956 and/or 1957. For data on earlier models readers are referred to the original series of articles, which is available now in the handy manual, *Servicing Automobile Air Conditioners*.

VORNADO (1)

The O. A. Sutton Corp., Inc.
1812 W. Second St.
Wichita 1, Kansas

This company entered the automobile air conditioning field in 1957 with its "Vornado" under-dash unit. This system is designed to fit late and current (1957) models of most U. S. passenger cars.

The Vornado system follows the conventional arrangement of having the compressor mounted on, and driven by, the car engine. Condenser is located in front of the car radiator, and the cooling case assembly is attached beneath the dash (see Fig. 1).

Two different systems of temperature and capacity control are available on the 1957 Vornado unit. One system employs a magnetic clutch on the compressor, the clutch being controlled by a thermostat. Other system has a by-pass arrangement which does not require a magnetic clutch.

Outward appearance of the cooling case is the same for both types.

Refrigerant-12 is used in both systems.

Compressor

The Tecumseh HH compressor is standard on Vornado units. It will be found in either vertical and horizontal mountings, varying with the requirements of the individual application. Likewise, it may be located on left or right

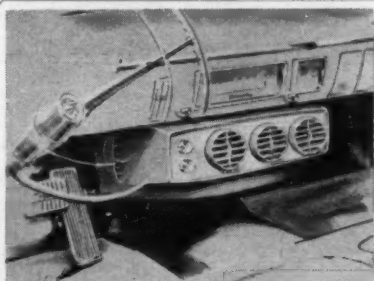


FIG. 1—O. A. Sutton Corp. entered automobile air conditioning field in 1957 with this under-dash unit.

side of engine, as required.

When compressor is mounted in vertical position, suction service valve is on left side (as viewed from flywheel end), and discharge service valve is on right side.

These valves may be mounted instead on back of compressor where they are located in same relative position as when on the side.

On Vornado clutch systems a Warner SF-660 magnetic clutch is mounted on the compressor shaft in place of the flywheel. Vornado by-pass systems, however, have the standard flywheel pulley on the compressor.

Condenser

Condenser is located in front of car radiator. Inlet and outlet connections are on the same side. Condenser is usually so mounted that these connections are on right (curb) side (Fig. 2).

A vertical mounted receiver tank is a part of the condenser assembly, and is usually found on the right (curb) side of the

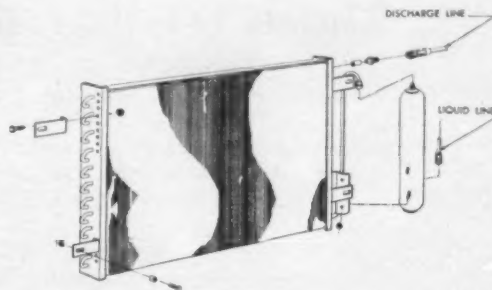


FIG. 2—Receiver on Vornado units is usually found on right (curb) side of condenser.

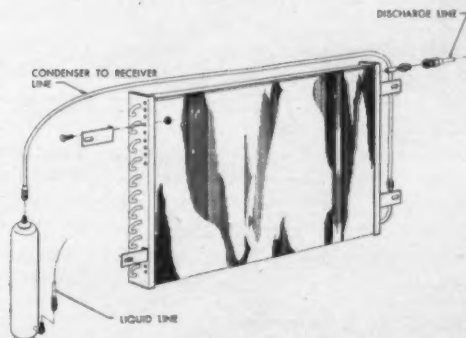


FIG. 3—Space limitations on some cars may require remote location of receiver on left side of condenser.

condenser. Some applications, however, require remote location of the receiver, even perhaps on the left side of the condenser (Fig. 3). In any case, the receiver will be found close to the condenser.

Receiver inlet is at top; outlet is on side at bottom.

A sight glass is provided at the receiver outlet.

No drier is employed in the

1957 Vornado units. Instead, 15 cc. of alcohol are in the system.

On Vornado by-pass systems an accumulator tank is provided in the suction line. The accumulator is usually located in the engine compartment, but its exact position will vary with the individual application.

Vornado systems having the magnetic clutch do not employ an accumulator tank.

(To Be Continued)

Novi Spokesman Says,

Automobile Dealers Would Gladly Give Up Air Conditioning Installation, Servicing

INDIANAPOLIS — Automotive dealers would be glad to have their air conditioning installation and service problems out of their hair, Richard C. Fagan, regional manager of Novi Equipment Sales and Service Co., Chicago, told the Indianapolis Section of the American Society of Refrigerating Engineers recently.

The problems of automotive air conditioning are more

"yours" than of the automotive engineer, he said.

In October, the section heard Herman F. Spoehrer, ASRE national president, itemize the responsibilities of the engineer.

They are to encourage young people to prepare for engineering careers, continually improve products, gain the confidence of the public through ethical conduct, sell performance instead of price.

Service & Supplies

Insulation Film Will Get First Showing at Buffalo ASRE Meeting

BUFFALO—The first showing of Dow Chemicals' new movie on insulation will be the highlight of the Dec. 5 meeting of the Buffalo Section, American Society of Refrigerating Engineers, to be held at the Hotel Lenox, Delaware at North.

William S. Schock, senior sales engineer, Dow Chemical Co., will incorporate this new film in his discussion of "The Development of Foam Plastics in the Refrigeration Industry."

Reprints Available

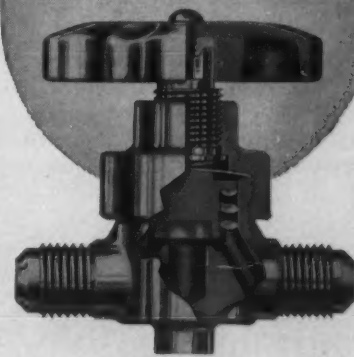
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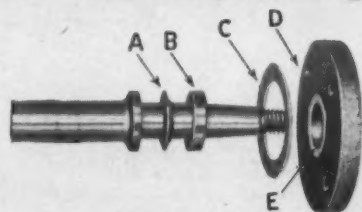
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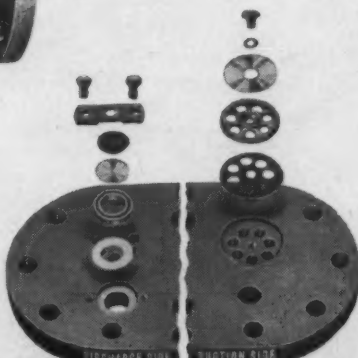
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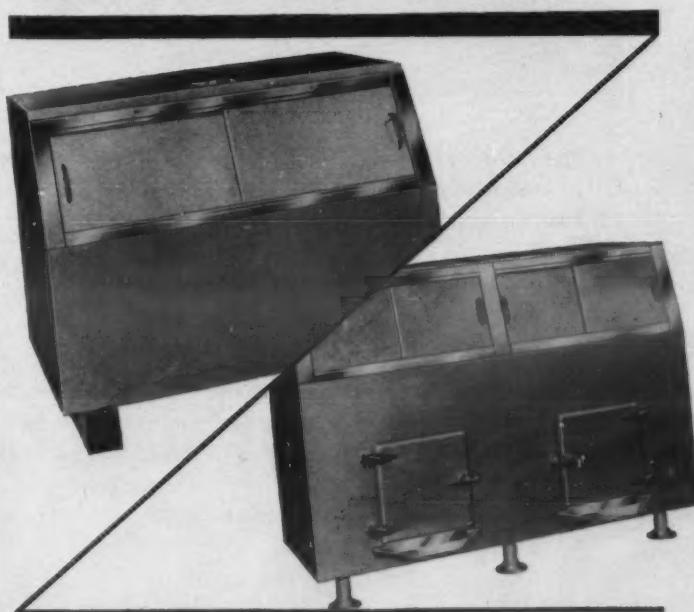
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'Powerful Sales Ammunition'...

(Concluded from Page 1, Col. 5) Industry has shown since 1952, the industry's manufacturers are not holding anything back in the way of new and improved products, or sales promotion and merchandising programs. (Details on industry sales by product groupings were published in the 3 preceding Pre-Show issues.)

With continued evidence of growing public acceptance, and market saturation figures low in comparison with other types of consumer durable goods and industrial equipment, the air conditioning industry remains confident that its greatest years remain ahead of it.

Pickup In Commercial Jobs In 3rd Quarter

The commercial refrigeration industry in 1957 has been running a little behind its banner years of 1955 and 1956, but there were evidences of a pickup in the third quarter, and the prospects for an improved 1958 are looking up.

Many manufacturers which have been introducing their 1958 models to their own field organizations will have them on open display for the first time at the Exposition, and others will bow in new products at the Amphitheatre.

'Biggest Show'

The 10th Exposition of the Industry, with some 260 exhibitors, will be the largest in the history of the event, reports R. H. Israel, chairman of the Exposition Committee of the Air-Conditioning & Refrigeration Institute, sponsor of the Exposition.

Advance information on the exhibits also indicates that there will be more air conditioning, refrigerated fixtures, and other "end use" products exhibited at this Exposition than at previous ones.

The Show is open to anyone who has any interest in the refrigeration and air conditioning field, selling, buying, installing, servicing, or designing the in-

dustry's products. Registration will be carried out at the door of the Amphitheatre. There is no admission charge. The general public will be admitted on the final day, Thursday, Nov. 21. Special buses will transport showgoers from downtown hotels to the Amphitheatre.

A number of industry associations are holding conventions or meetings at or near the time that the Exposition is being held. Some of these groups will have concluded their meeting before the Exposition opens. Those who will still be meeting during the Exposition week, and their headquarters, are as follows:

Meetings Scheduled

Air Conditioning & Refrigeration Wholesalers, Nov. 18, Morrison hotel; National Association of Practical Refrigerating

Engineers, Nov. 18, 19, 20, Del Prado hotel; National Commercial Refrigerator Sales Association, Nov. 18, 19, La Salle hotel; National Heating & Air Conditioning Wholesalers, Inc., Nov. 18, 19, 20, Morrison hotel; National Warm Air Heating & Air Conditioning Association, Nov. 21, 22, Morrison hotel; Refrigeration & Air Conditioning Contractors Association, Nov. 18, 19, Drake hotel; Refrigeration Service Engineers Society, Nov. 18, 19, Morrison hotel.

try sales of home freezers held about even with last year and household refrigerator sales dropped slightly, National Electrical Manufacturers Association estimates.

Based on an expansion of data reported to its statistical department, NEMA puts indus-

try sales of home freezers at 79,000 units for the month as compared with 79,100 last year. Refrigerator sales were 265,200 as compared with 277,300 in September, 1956.

For the first nine months, an estimated 745,300 freezers were sold both here and abroad by industry manufacturers as compared with 796,000 units last year. Refrigerator sales, which had just topped the 3 million mark Sept. 30 last year, were 2,627,500 this year.

Cleveland ASRE Meeting Nov. 19

CLEVELAND — The Cleveland Section of the American Society of Refrigerating Engineers announces that at its Nov. 19 meeting, E. S. Bishop, senior application engineer with York Corp., will speak on "Proper Capacity Control of Refrigeration Systems."

Reports 745,300 Freezers Sold In 9 Mos. Dyas Appointed Cory Contract Sales Chief For Air Conditioning

CHICAGO — J. W. Alsdorf, president of Cory Corp., announced the appointment of Robert Dyas to the new post of contract sales manager for air conditioning. He will report directly to Alsdorf.

For the past ten years, Dyas has been associated with Hupp Corp. in an executive capacity. During that time, he has been in charge of sales for the automotive merchandising program, sales manager for refrigeration and contracts, and in charge of the firm's ordnance training program.



Robert Dyas

This NEW "UNIVERSAL-K" Coil Will Revolutionize Product Design and Performance!

FRICK - THE LEADER IN THE REFRIGERATION INDUSTRY SINCE 1882—HAS MADE ANOTHER STEP FORWARD.

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Made of continuous tubing, there are NO RETURN BENDS, consequently less pressure drop. It is a space saver, permitting a motor to be installed in the center of a coil using either radial or axial air flow patterns. On competitive tests the "Universal-K" has out-performed conventional types of air conditioning evaporator and condenser coils in rate of BTU transfer. Manufacturers of air conditioning and dehumidifying systems are invited to consult with our engineers in connection with the design and adaptation of the "Universal-K" coil to their products.

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The lower cost and higher efficiency of the "Universal-K" Surface Coil will appeal to any manufacturer. Write for details.



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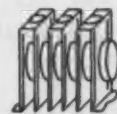
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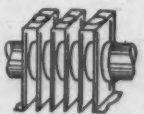
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A "Universal-K" follows air flow pattern of an air prime mover, because it can be furnished in round, pie plate, oval or cylindrical forms.